PS
THE PREVENTIVE MAINTENANCE MONTHLY
JULY 1951 ★★★★★ VOLUME 1 NUMBER 2
Will Eisner

SECRETARY OF THE ARMY
WASHINGTON

JUN 12 1951

Dear Sir:

After seeing the first issue of the successor to Army Motors Magazine, I can well understand why General Collins was so enthusiastic in his welcoming letter to you last month.

I am equally aware of our increasing need to maintain our automotive equipment in condition to meet any action we are called on to face in these uncertain times. I see the balance sheets every day that drive home the higher cost and longer hours we pay for every item we need to keep America strong and free.

Your fresh and readable style of teaching the normally dry technical lessons must surely appeal to all ranks and grades, if they're the same people they were before they put on the uniform. And I'm sure they are.

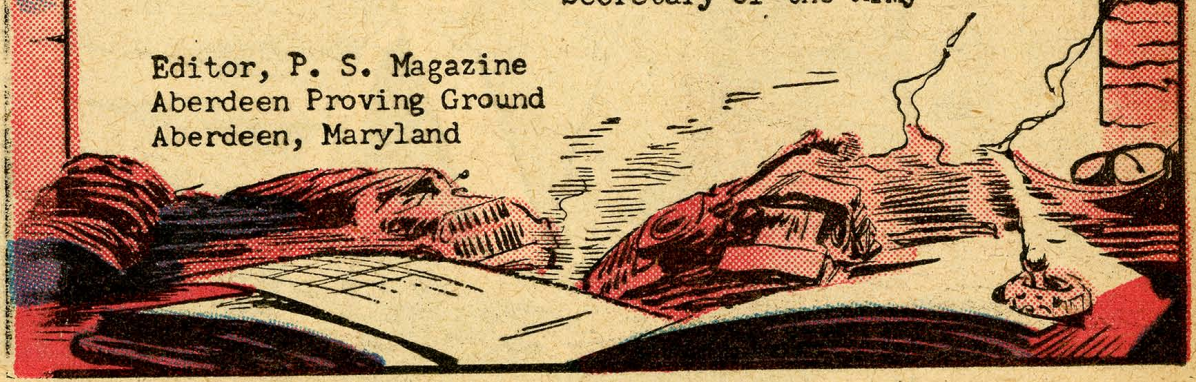
Best of luck to you in your efforts. Much of what we're preparing for today could not have come about if people everywhere were well informed.

Cordially,

Frank Pace, Jr

Frank Pace, Jr
Secretary of the Army

Editor, P. S. Magazine
Aberdeen Proving Ground
Aberdeen, Maryland



..the balance sheets...drive home the higher cost and longer hours we pay...to keep America FREE....."

Frank Pace, Jr.
Secretary of the Army

P. S. Magazine
JULY 1951

IN THIS ISSUE

ARTICLES

Keep Your Beaver Eager	50
Homemade Jeep Muffler	68
Bull session on the M46	74
How To Live With Your Winch	78
Five Fast Ones on the M38	82
Jeep Loading Sling	88
Unsatisfactory Equipment Report	3C

FEATURES

Letter From Mr. Pace	2C
How To Start A Stalled Engine	58
Joe Dope Limerick	66
The Lower Echelons Let Down	4C

DEPARTMENTS

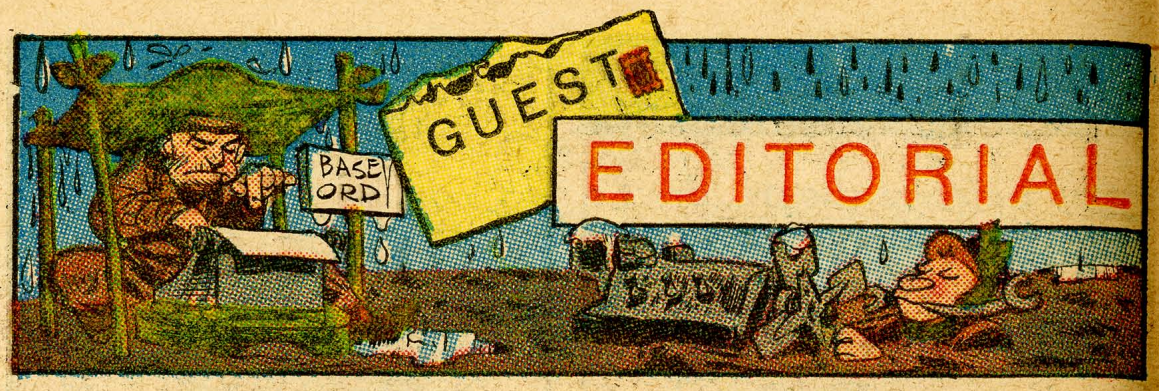
Guest Editorial	46
Combat Maintenance	47
Connie Rodd	55
Contributions	71
Sgt. Half-Mast	84

P. S. MAGAZINE is published monthly in the interest of Preventive Maintenance for service-wide distribution to all organizations as part of the PREVENTIVE MAINTENANCE PROGRAM.

P. S. Magazine is glad to get your ideas for articles and illustrations, and is glad to answer your questions. Just write to:

Editor, P. S. Magazine
Aberdeen Proving Ground, Maryland

DISTRIBUTION: A 5; AFF 3; ARM & SV BD 3; ARS 3; B 3; BASE COMD 3; BN 5; C 12; CHQ 3; D (ORD)- (3) EXC. TNG. DIV. 10; DEP 10; DISCIP BKS 10; DIST 3; DIV ENG 3; FC 3; GH 5; GH (LIBRARY) 15; MDW 3; OSD (ORD) 2; OS MAJ COMD 5; PE 3; R 3; ROTG STA 3; ROTC 3; S BN 3; SCH-(3) EXC. USMA 25; SCH (LIBRARY) 5; SEP C 5; SH 5; SH (LIBRARY) 15; TECH SV-3; (EXC 9) 10.



15 May 1951

Dear Editor,

Hereabouts, maintenance is a very rough-and-ready sort of thing. When a GPW needs a new windshield you chisel some Plexiglass from Technical Supply (maybe) and make one. Tops generally began life as tents or tarps. Not to mention the vast numbers of jeeps with neither top nor windshield.

I am sitting here looking at our Chevrolet 4x4 dump truck. Lord only knows how or where we got a dump truck in a bomber squadron, but we've got it. There sits one of the best running and most useful trucks we've got—30,000 miles up on it, sans doors, sans windshield, sans engine side louvers, still banging away hauling gravel, garbage, etc.

We have a miscellaneous collection of rolling stock, running from the CO's brand-new jeep to the line chief's old-style Dodge pickup, and we have had to adapt most every type of part to some use for which it was not intended. Whenever a device is needed (such as power-driven winches on bomb service trucks), we simply make it. The only question the inspector asks is, "Does it work?" Modification kits are things we read about. Likewise Modification Work Orders.

Still, for all our unorthodox methods, a very small percentage of our vehicles are on deadline and most of these are awaiting parts.

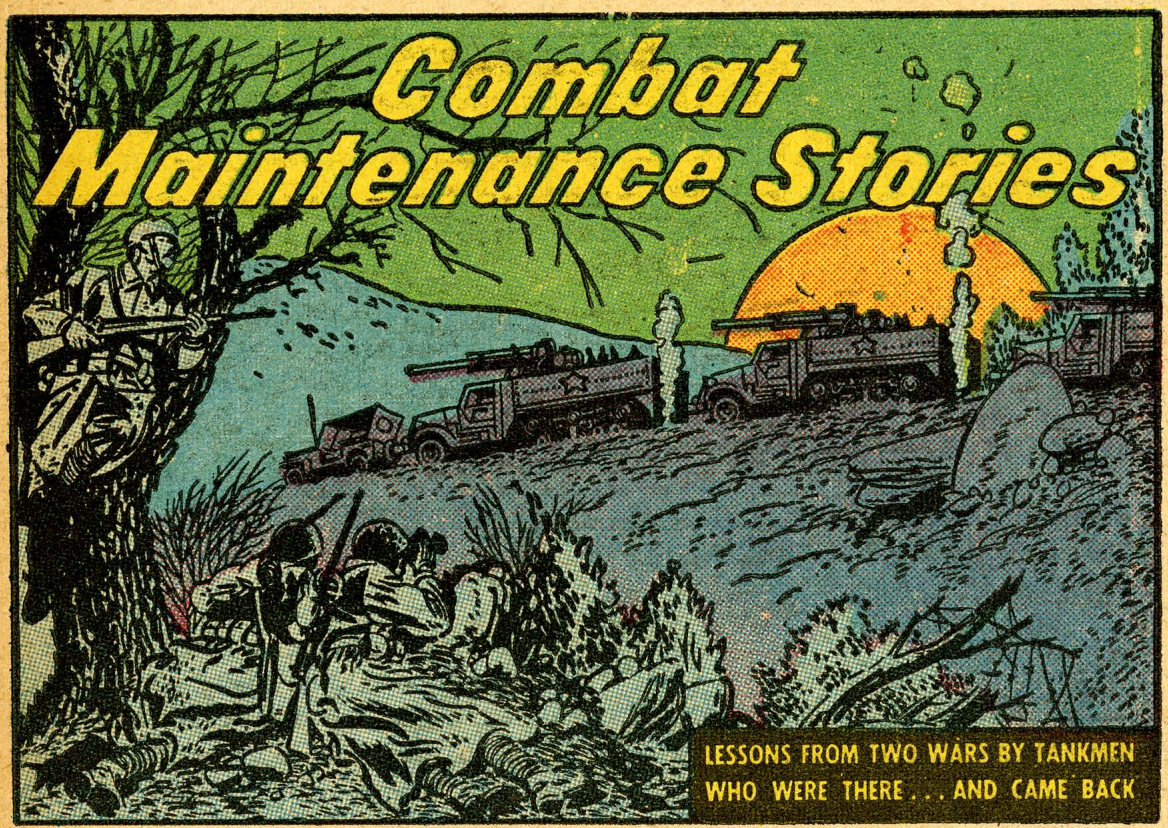
I commend you most highly, by the way, for harping on the parts hoarders. We're on the dirty end of that stick out here, but plenty!

One of the things that cause wry grins here is the Z.I. custom of leaving keys in all vehicles. The affinity between stray soldiers and parked jeeps is amazing. Leave your key in and the next day your jeep, with altered numbers, adorns a motor pool thirty miles way. I know of one that ran out of gas and was left without key, rotor, distributor housing and coil wire—still it was gone two hours later!

Also find stateside notions on cleaning vehicles a bit whimsical. Ever been out here when it rains?

These driver classifications and awards are another thing. Any man in our section can and does operate anything from little Australian motorcycles up to the Autocar gas truck—but if you can get three GI operator's permits amongst us, it's a minor miracle (sure we had 'em once). But as to wearing a dingleferry on

(continued on page 87)



DO IT BEFORE DAWN

Cpl. L. C. Miceli—Purple Heart

We always warmed up our M10 Tank Destroyers before dawn. They're the Diesel jobs you know. They made a lot of noise when you started them, but in the dark it's hard for the Germans to tell exactly where the noise was coming from. The thing is the smoke won't give you away. **When they're started up they give off a terrific cloud of smoke—sometimes 10 to 15 feet high. In the daylight you'd draw a flock of 88 shells around quick with a cloud like that.** Even when it was misty and damp **we started up before dawn.** The only difference was then the cloud from the exhaust settled down and hung on the ground around the vehicles. That's just as bad. It'd give you away. We always got the jobs running good before dawn. That was when I was with my outfit fighting in Italy. The boys from there could tell you a few.

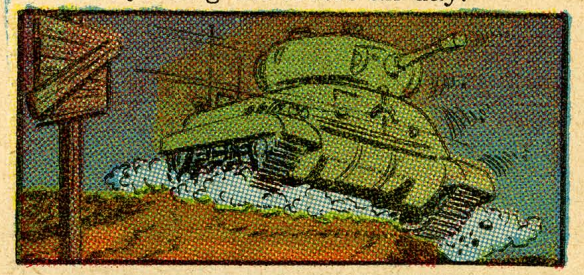
Another thing, **we had to be careful about the exhaust giving away our position. Those two exhaust holes in the back shoot out a blue streak.** Sometimes we had to run the engines in bivouac at night so the battery wouldn't run down while the radio was on. There's no auxiliary generator on these jobs. About the exhaust flame though, **we dampened our mosquito nets and hung them down over the back so you couldn't see the flame.** I know this isn't good for the nets, but that flame would have brought enemy artillery fire in a flash.

MIDDLE OF THE ROAD

Pvt. C. Sciara—Purple Heart

Back in the States one of the instructors we had said something about driving in the center of a high-crown road, OK. Over there in Tunisia, I found out what he meant. We had a long drive up to the combat area. Incidentally, I was at the

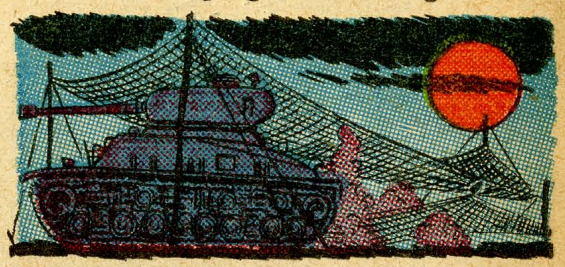
tail end of the convoy and I had a tough time. The line moves slow, but when you're at the end you have to step like hell to keep up. Anyhow, we were riding all over the road. It was a high-crown road, but a lot of us drove along the low side, I noticed the tank wanted to edge off the road more and more, and I had to keep correcting it, pulling on the lever to keep it on the road. Thought nothing of it, till we went into action at Tebourba. I noticed I had trouble maneuvering. The tank wouldn't zigzag as well . . . worked OK on the one side, but didn't brake on the other. I must have worn the lining down on one side while we were on convoy. Luckily I got maintenance to fix it. **Tell the tank drivers to keep in the center if they're in a place where they have to ride on a high-crown road. It keeps from wearing the track out on one side, and from wearing the steering brake out on one side,** and keeps you from wearing yourself out jerking the levers all day.



HULL-DOWN TO STAY ALIVE

Pvt. C. Laws

We did a lot of firing from what they call a "hull-down" position—when the tank's positioned so the hull is down below the crest of a hill and just the gun and turret show. It's good sense, and every driver knows it. And it's the driver better than anyone else in the tank who can tell when the tank's in a good hull-down. That's what we found. **I always knew I was in good hull-down when I could just barely see over the top of the hill.** I was sure we were down low then, in protected position. That's all part of the business of keeping from making a silhou-

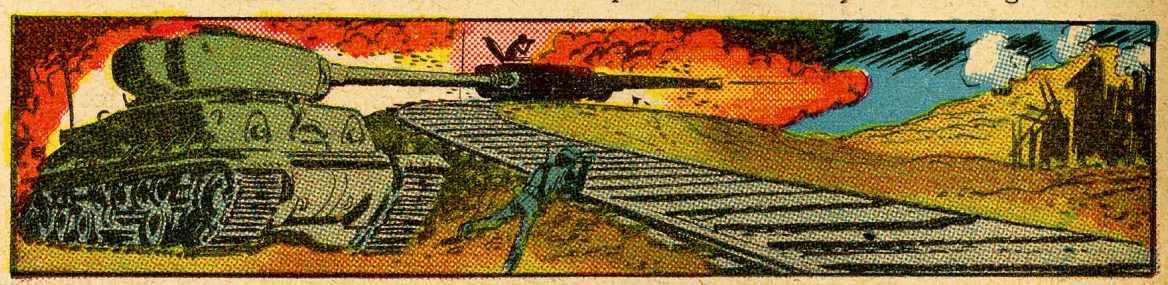


ette of your tank. Near Maknassy in Tunisia a few tanks went roaring over the crest of a hill and got hit in the belly. They made a clean outline against the sky. The Krauts could pop a tank off the skyline at 2000 yards. We always tried to pick out the little valleys and turns, and we came through.

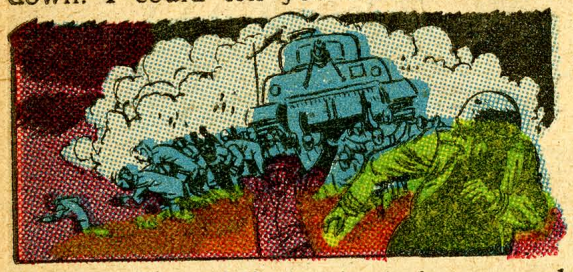
G.F.U. DRIVER

Sgt. C. M. Hedgepath

I was a tank commander on an M4 in Africa. Yes, I had good drivers. There was one, though. He was pretty bad, and we had him transferred to a different outfit. We were fighting around the port of Farina, near Bizerte you know, at the time. **This driver liked to cowboy a tank around.** Did it regular. He slammed over a rock one time and almost threw me out of the tank. Played hell with the gunner too. **Didn't give the gunner good firing positions.** He couldn't understand that speed isn't the important thing. **Maneu-**



verability and good sense are. And having a cool head. This guy wouldn't even listen. We came out of combat one time and I told him to open his hatch, the war was over. He wouldn't do it. We were driving near a column of German prisoners and I didn't want to go running them down. I could tell you more. He din't



know how to shift. He'd grind away and waste a lot of time. Had to stop the tank while he fooled around and picked out one of the gears he liked. In fact, I think if it wasn't for that driver we wouldn't have had one tank shot out from us. An 88 hit the track, then another one. We just weren't in good position. Not all the drivers are like him. Now later on, I had a driver . . .

FIRE HERE, FIRE THERE . . .

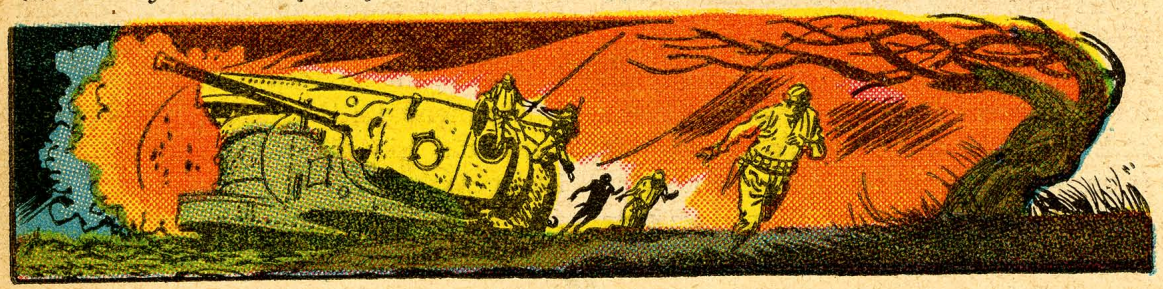
Sgt. J. T. Fitcher—Purple Heart

I guess I had the wrong idea when I went overseas into combat. I saw movies and pictures of tanks catching fire and flaming up in smoke soon as a shell hit them. That's the crap. I was in two tanks that were hit in North Africa. One time we were just turned bottom side up, and we crawled out the escape door. And the other I got out through the turret hatch. You have at least 4 seconds before a tank catches fire—if it catches at all—and in that time you can be plenty far away. But don't get to feeling that nothing can lick you either. A lot of the equipment I saw was nearly as good as ours. That 88mm gun they have can be greatly under-estimated, but never over-estimated. Just realize they're as strong as you are, and you'll fight that much harder. And you've got to work hard. Back here, you see men in training who have only one thought in mind—getting back to the PX for another bottle of beer. In battle a driver has only one thought—his tank. He stays with it 24 hours out of 24. No, he doesn't climb down and go through the whole fancy 100-hour check. He doesn't do it at all at one time. It's five minutes here and there. They add up to a complete service.* Every time we pulled back, our driver'd run out with a grease gun. Every time we stopped, he'd check or grease something. He'd start at one place and do a little. Next time, he'd start where he left off and do a little. That way it doesn't seem like he's actually doing any maintenance at all. It's that easy . . . but before he knows it he's been through a regular maintenance-service job.

WHAT'S YOUR COMBAT STORY?

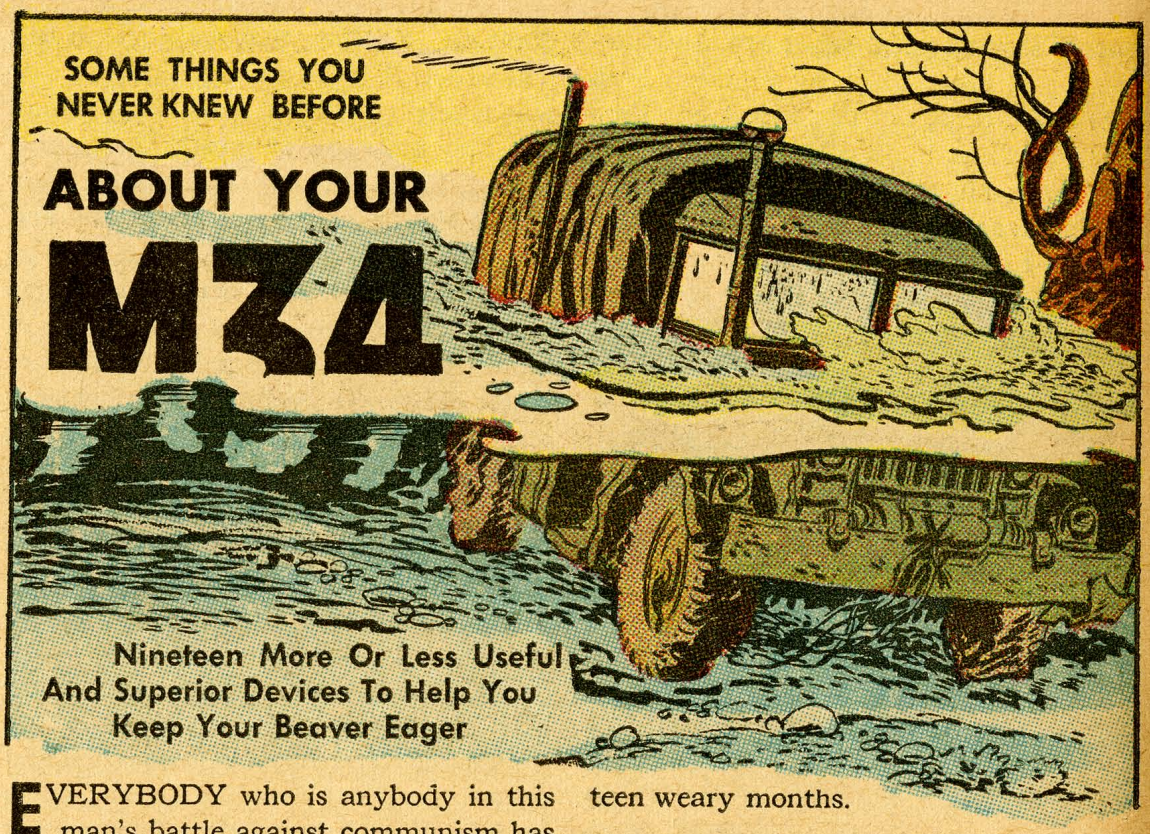
Red aggravation turned your hair white? Or black? P. S. wants to hear about it. Leave it to P. S. to dress up your story with cartoon and color and pass it along to a million other Joes who like their hair as is. Write to: P. S. at Aberdeen Proving Ground, Md.

(free personal copy if you do)



SOME THINGS YOU NEVER KNEW BEFORE

ABOUT YOUR M34



Nineteen More Or Less Useful And Superior Devices To Help You Keep Your Beaver Eager

EVERYBODY who is anybody in this man's battle against communism has had a piece to say about the new 2½-ton trained seal now hatching out of factories at Lansing and South Bend.

From some of the louder ones, a lot of it has been bad.

For lack of a better, or more printable name, we'll call these characters the neophytes. 'Cause it's old stuff to us graybeards, that if you got to make a completely new, different and daring model of fighting vehicle, then you also got to put up with a lot of completely new, different and daring kinds of aggravation.

The boys who really know the score, or as you might hear it said across your favorite PX beer dispensary about 2100 hours any quiet evening, **the boys who really know the score** are saying that this here now new truck is all a fella could ask for if he was to want a cargo deal that's at home **under** water as well as alongside it on a hard paved road. To say nothing of the not-even-paved-at-all road we been getting thrown at us these thirteen-fourteen weary months.

RADIATOR-AND-FAN SHROUD

You take this radiator business for example. Who could've figured deep water pressure would drive the cores back into the fans (fig. 1) like it did in the surf tests? And you havta unnastan that while the tests were **still** being made under all such conditions, some thousands of more trucks were being punched off the line according to schedule. All of which had to be modified to meet the unexpected . . . wherever it might come from. So now according to one of a small list of engineering-change orders, your M34 radiator is a half-inch farther forward, three-sixteenths higher off the frame, and the stay-rod is always to be in the forward hole (fig. 2) of the plate on the head. And instead of the fan looking like the picture in the manual, it's had its ears clipped to keep it a trim distance away from the honeycomb. This helps a little too, to save fingertips for guys who insist on using the fan-shroud for a handhold (fig. 3) when

they climb up on the front bumper with the engine running. Tsk, tsk.

WIPER-MOTOR EXHAUST

And while we're under water, leave us also remember that it's SOP to keep the wipers running so the exhaust will discourage any water from getting down into the wiper motors . . . to give us corrosion trouble later on. In case you don't see this item on the list of details under 'Fording Preparation' just unlimber your ball-point and write it in after you get down below. See how right those ads were that talked you in to it.

While the water pump has nothing to do with fording, and while you personally may never have occasion to get acquainted with the water pump maintenance, it is not an important waste of your time to learn here and now that the bearing set-screw is always to be adjusted **finger tight only.** If you drive this particular screw like you would the average set screw, it pre-loads the bearing and pretty soon burns up your water pump. Tighten it finger tight, then hold it steady (fig. 4) with your Allen wrench while you tighten the lock nut.

ENGINE OIL ETCETERA

Working our way back from the cooling system now, we find people generally overfilling this truck with engine oil. And we were told, overfilling by as much as **nine quarts.** The way it happens is that they forget to run the engine each time they add a quart to see where it comes to on the dipstick. That's right, **run the engine for two minutes after you add a quart of oil,** then stop the engine and wait two minutes before you take another reading. When it's low, say to halfway between the full and low marks on the stick, it'll take about **one quart of oil** to bring it up to normal. Where you go wrong is not remembering that the oil pan has two sumps (fig. 5) that help give the truck its full gradeability. The sump you dip into for a reading doesn't get all the oil you add through the oil-filler, until the engine is started and the scavenger pump sucks the oil from the shallow sump into the main oiling system.

Another way you can get a wrong reading is to screw in the retaining cap on the dipstick when you check oil. We all know of course that new dipsticks were issued all around that tell you in bold, embossed-steel letters that you should "UNSCREW TO CHECK" (fig. 6). The TM of course, will be changed on the next go-round, so the picture will agree with the stick you've got. Unless of course, you get one of the blank dipsticks that somehow slipped past the punch press while the operator was watching another operator brush some dust off her safety shoes—in which case you can refer to this page of P. S. Magazine, which says "UNSCREW TO CHECK."

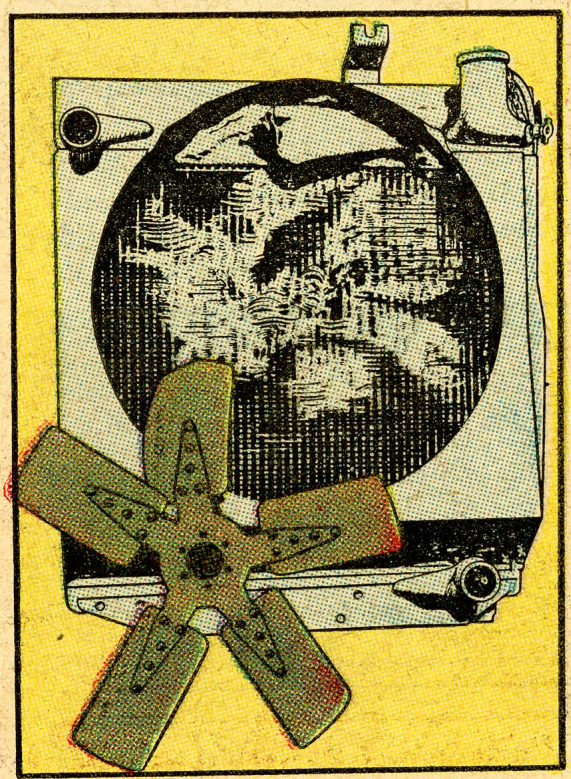


Fig. 1—Some say the radiator hits the fan. Some put it a little different. Neither will happen after you move it up and out.

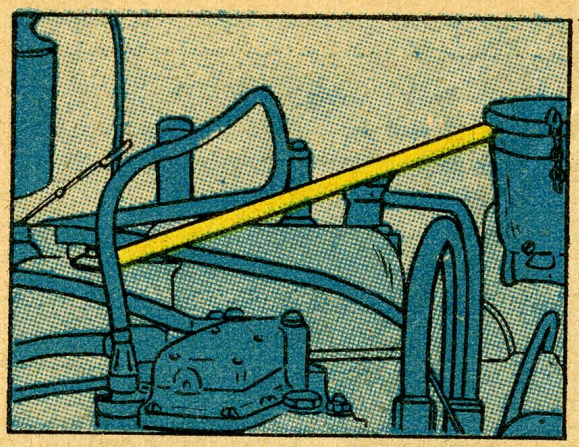


Fig. 2—Once you've made the other changes and got your hoses adjusted to fit, always keep this stay-rod in the foremost hole.

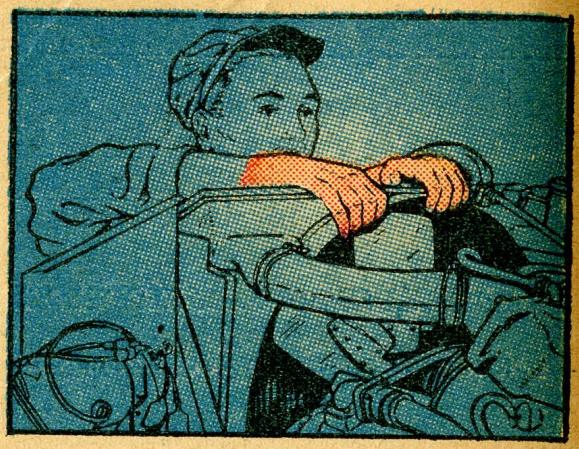


Fig. 3 — Connie Rodd saw this picture and gahdarn near lost her breakfast. Keep our Connie cute by keeping your cuticle.

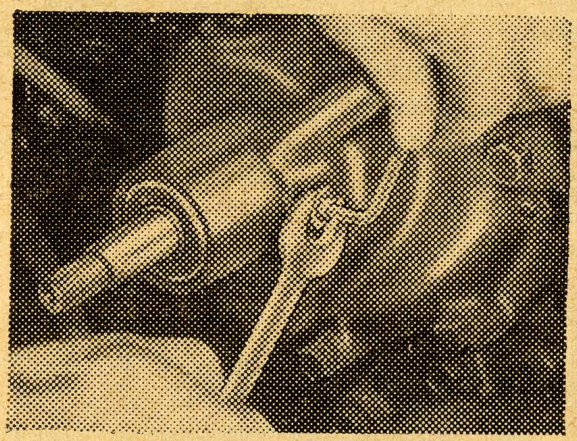


Fig. 4 — Picture of a man who adjusted his water pump set-screw finger tight, holding steady while he tightens the lock nut.

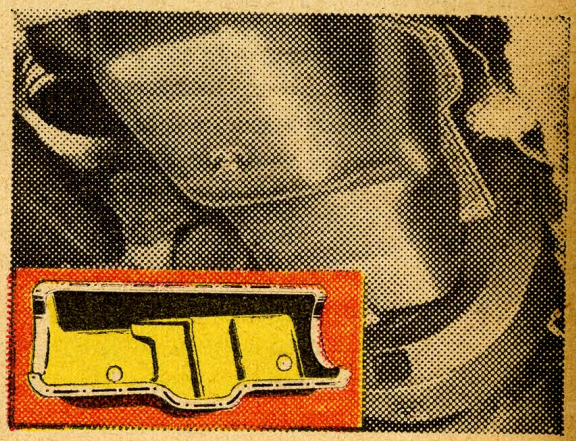


Fig. 5—In case you're still not sure of what goes on with this oil pan, well, go out and unscrew one and see for yourself.

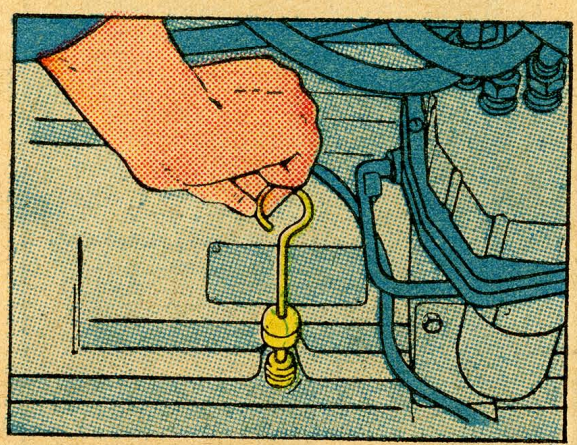


Fig. 6—When you dip your stick in this crankcase, keep the cap unscrewed. Otherwise you'll get it wetter'n you oughta.

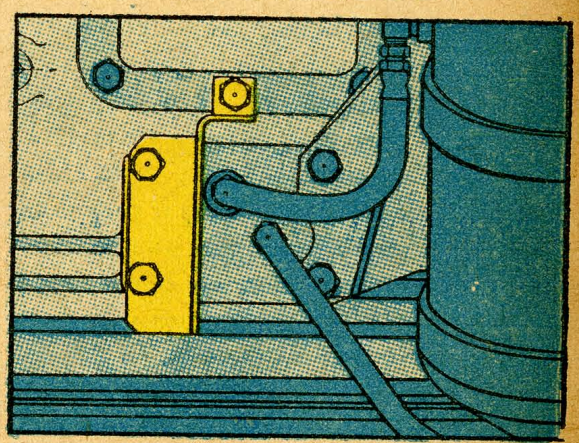


Fig. 7—It goes without saying that you'll reach for the nearest bean can to make it, but don't say we didn't tell you 18 gage.

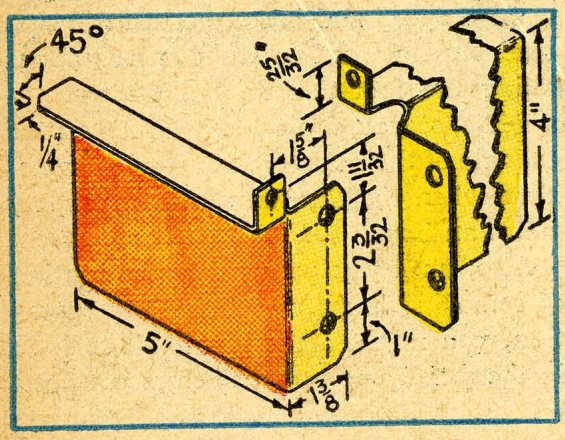


Fig. 8—Three bolts to take out and put back and you've taken the heat off the oil-filter oil-lines with this hose shield.

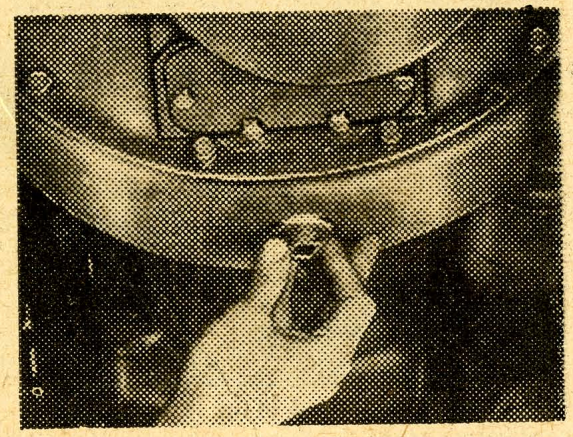


Fig. 9—Flywheel housing **got to have** drain plug when fording. Got to **not have** drain plug when not fording. Otherwise . . . UGH!

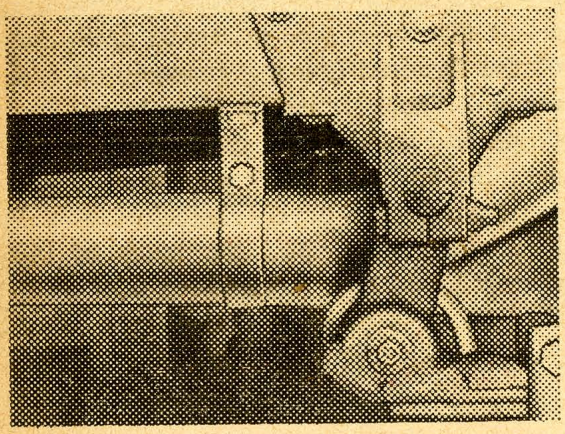


Fig. 10—This is the exhaust-pipe clamp removed by OTAC crews to keep from breaking manifold bolts. Please to leave it off.

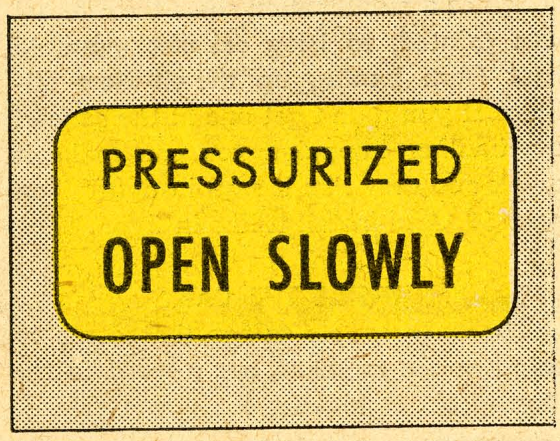


Fig. 11 — Here's your reminder to remove caps slowly from pressurized tanks. Yours should be along in decal form any time now

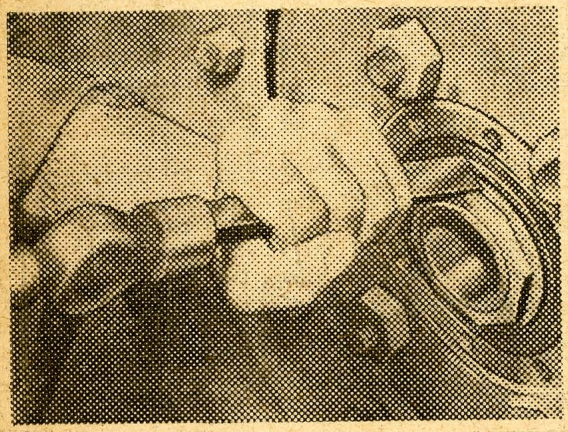


Fig. 12 — So there is no mistake about what P.S. said to do, **this is not the way** to peen axle-nut locks. Scram wid dat chisel.

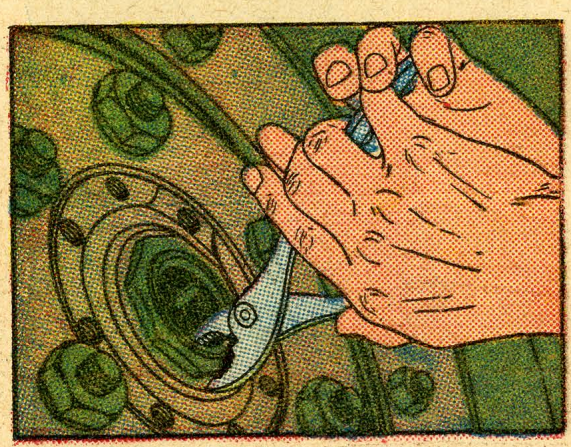


Fig. 13—Instead of the mayhem at the left you squeeze that washer-lock gentle 'n easy like you'd want to do if it was a firing pin.

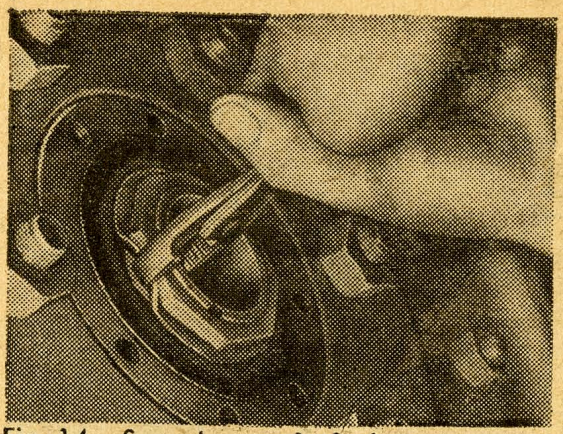


Fig. 14—Same here as in the last picture except you squeeze the lip toward you and mash over a section at the opposite flat.

Then there's the heat shield that's been added as a modification since the manual was printed, to keep exhaust manifold heat from lousing up the oil-filter oil-lines. If you didn't get one in the general overhauling campaign you can make it quick and easy like it says in figure 7 on page 52. And install it like in figure 8.

INSIDE THE CAB

The only couple things that come to mind at the moment, are a word to the clumsy about kicking the power-takeoff lockout so the winch maybe gets engaged at high speed and busts the transmission case. And a word to the cautious about oiling the foot-throttle linkage once in a while, so you don't find yourself on the tailgate of the next truck in convoy sometime when the throttle sticks at umpety miles an hour.

Also, until you get used to the routine of removing it after each fording operation, you might make it a habit to look in the map compartment before you turn on the ignition switch and see if you can account for one each, flywheel housing-drain plug (fig. 9). Seems this little detail has been quite overlooked in several hundred dozen cases here lately, with the result that what was meant to drain out of the flywheel housing (namely oil and water-of-condensation) rises to wading depth and makes short work of clutch assemblies and what have you. Well, if you must pin down a purely rhetorical remark like 'what have you,' the truth of the matter is you have a deadlined M34 while the clutch is being replaced. Of course, you'll remember to screw the plug into the

(continued on page 77)

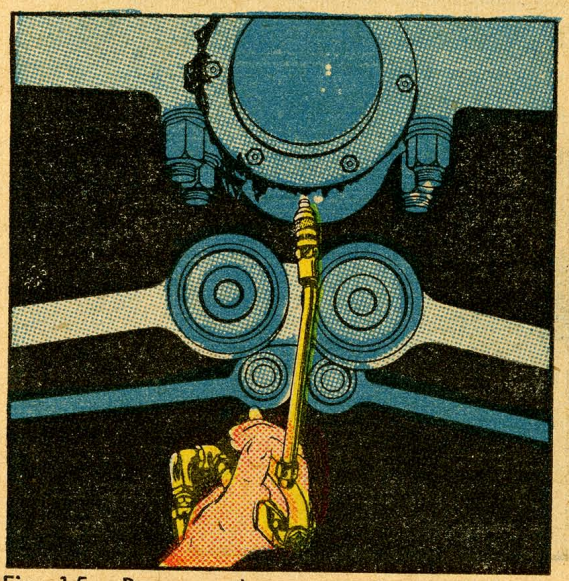


Fig. 15—Because the rear-spring-seat bearing has no relief port for old grease to get out, you got to loosen the bolts.

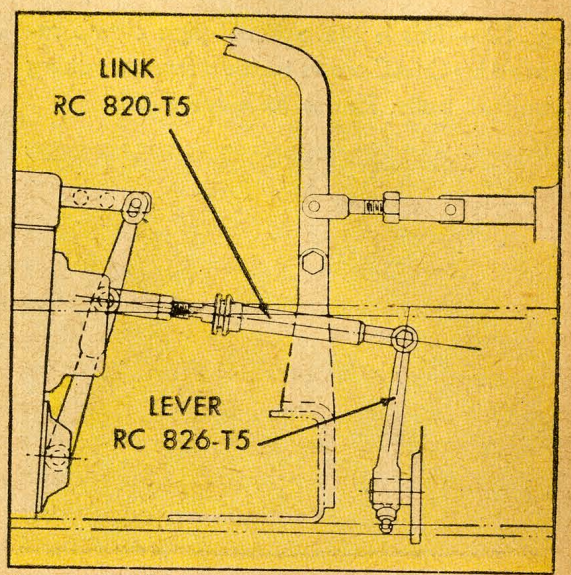
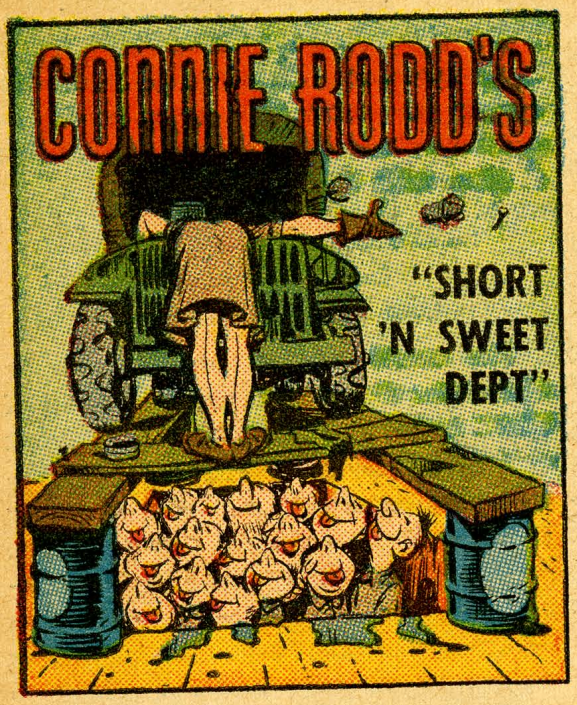


Fig. 16—The vital news here is to learn from the small lecture on page 88 that 'barely starts' means not more than 1/32".



AMBULANCE BODY-HOLD-DOWN BOLTS

All you guys who have to bounce a ¾-ton Dodge ambulance over rocks and rills better make it a point to keep the body-hold-down bolts good and tight. When the terrain acts up, loose bolts'll let the front end of the body twist enough to fracture sheet metal and break welds, especially at the bottom of the front-door post and at the spot welds above the front doors. If water leaks through the moulding that joins the cowl to the roof panel, it probably means that the body bolts have been on the loose too long. It's a little late, then, to start tightening them.

The bolts along each side of the ambulance body are easy to get at, and it takes only a minute or two to check and tighten them. I've found that from 35 to 40 ft.-lbs. on the torque wrench is just about right. To make sure they're kept tight, include them in your regular monthly or 1000-mile inspection routine.

If those bolts have already worked loose while you weren't looking, and some welds have already broken, simply reweld and repaint them. Stopping a leak at the roof-panel moulding takes a bit longer: First, remove the wind shield-header-panel cover-plates. After removing the paint from the moulding and the metal around it, weld the moulding to the roof and cowl panels (don't forget to protect the windshield-wiper motor and hose with a piece of sheet asbestos). Solder over the weld and smooth it. Repainting the moulding finishes the job, except to replace the cover plates.

HYPOIDS IN TROUBLE!!

Teletypes usually call for important action, and when that action ain't taken there's usually some important trouble. So in the case of TWX Number DA88635, which was intended for the memory of all concerned, but somehow never got past their ears.

This TWX said to stop using a certain lot of gear oil from the Imperial Oil Co. for hypoid-type gear cases, or else we'd have hypoid gears falling out all over the lot.

Now it turns out that those drums of Imperial gear oil aren't marked with any contract number, and nobody knows what oil's in what containers. So they've frozen all stocks of Imperial Oil Co's oil against use in hypoid-gear cases.

I'm also asked to tell you that if you think you've got any of your hypoids swimming around in Imperial oil, you'd better drain it, rinse the residue, and switch to a lube furnished the QM by other companies.

FIXES FOR DUMP TRUCKS

Here's some juicy tidbits (from TB ORD FE30, 9 Mar. 45) that should give you a lift in holding up Gar Wood hoists on your 2½-ton GMC and 4-ton Diamond-T dump trucks.

If the body of your dump truck tilts to one side as it rises, look to the rear body-hinges for your trouble. Maybe one of

them is mounted either ahead of or behind the other. If so remove the hinge that's out of line and place it so it's even with the other hinge by drilling new mounting holes in the frame.

When you can't lower your dump body completely, the tension links (Fig. 2) may be too long, which means they'll buckle and bind. To get these links down to the right size, first remove and straighten them out. Then have someone heat the links in a forge to shrink them to a free-fitting size. On the other hand, if you can't raise the body fully, it could mean the tension links are too short. Then you do the same thing. Remove the links, heat them in a forge, but stretch them to the right size.

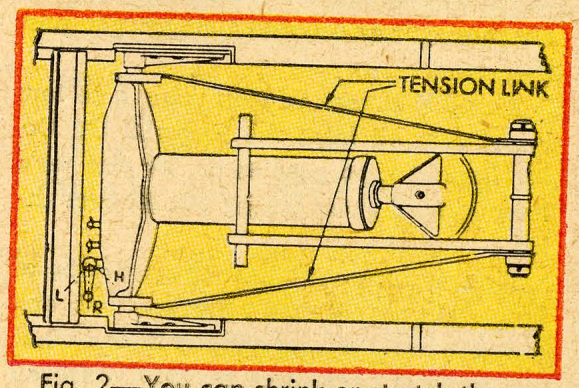


Fig. 2—You can shrink or stretch these.

A good way to keep the tailgate upper-hinge-pin-bracket bolt tight is to weld the bracket in place as shown in Fig. 3.

Often the body-hinge lock-pin won't hold the body-hinge pin. You can replace this pin with one that's got a head and a cotter-pin lock. A field friend says that to keep from losing the hinge pin, he uses a longer pin—about half again as long—drills a ¼" hole in each end, and holds it in place with two cotter pins. Try it.

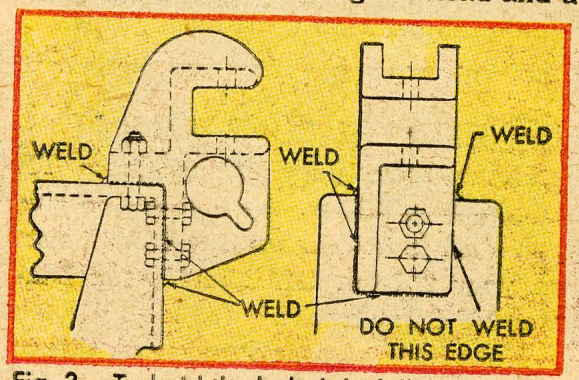


Fig. 3—To hold the bolt tight follow the fillets shown in these here wiggly lines.

ONE TWIST OF A WRENCH CAN RUIN YOUR GMC HYDROVAC UNIT

The trouble centers around the tube assemblies that sprawl across the top of GMC hydrovac units. On both the first and second-series hydrovacs, the tube-ends that screw into the valve assembly (see Figs.) are adorned with hex nuts. At first glance, these nuts look like ordinary fitttings, like jam nuts; but if you take a second glance you'll find they're welded to the tube and not meant to come off.

Each weld serves only one purpose: It keeps the tube from being squashed with a wrench. The nut gives you something to grip with your wrench **when you're unscrewing the tube from the valve assembly.** You don't turn the nut. You turn the tube by grabbing a hold on the nut. And if you care to do some investigating, you'll discover that in order to turn the whole tube from the nut end, the tube'll have to be **first** disconnected at the other end (the hose end).

What happens if it's not disconnected at the hose end first? Then you're right back where you started: The tube won't

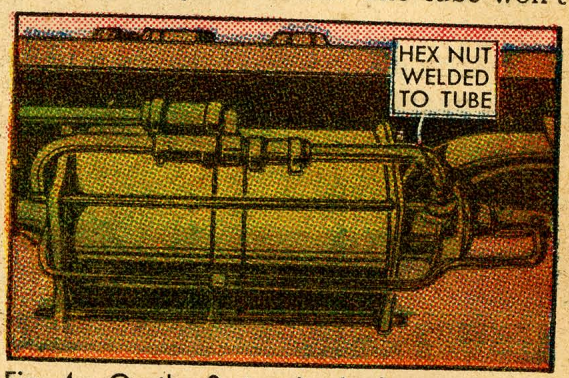


Fig. 4—On the first-series hydrovac the hex nut is welded to only one of the tubes.

turn and you'll break the weld on the nut—you and your rippling muscles.

This all adds up to the important fact that you can't tighten or loosen the tube by simply turning the nut. You have to turn the whole tube—and in order to do it, the tube's gotta be unhooked at the hose end first. Otherwise, there'll be a lot of hydrovac units with loused-up tube assemblies being shipped for rebuild, inspection, or rejection; and a lot of deadlined GMC's giving you a rousing Bronx cheer.

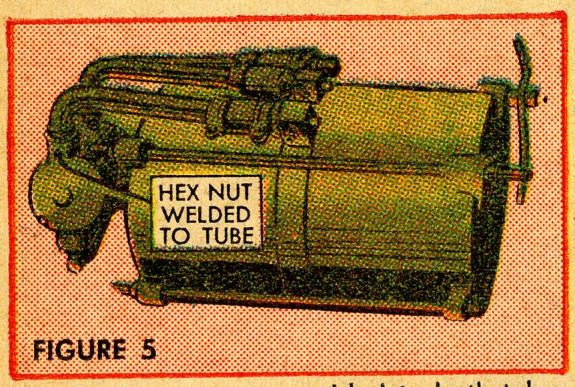


Fig. 5—Hex nuts are welded to both tubes on second-series—means loosen both hoses. Only one shows here but the other is there.

M20 TRANSPORTER WINCH MAINTENANCE

The winch on the 12-ton 6x4 Diamond-T M20 Diesel transporter has an automatic torque-control-and-solenoid arrangement that shuts off the engine when the line pull is greater than 22,400 lbs. to keep from busting wire-rope and shear pins. But this it will do, **only** if the torque-control is kept in good order. Here are the two main things you need do to **keep** it working.

One is to see that the torque-control spring-pressure is adjusted like it says in TM 10-1225. And after you make the adjustment once, try to remember it ever so often. Torque-control spring-pressure needs periodic resetting. Like the crease in your suntans, it's got to have its wrinkles ironed out after a few uses. Else you'll get baggy knees from bending to replace shear-pins.

The other thing is to lube the rocker assembly on the torque-control unit. The rocker assembly is pivoted on a pin [illegible] and if you forget to lube it with engine oil about every 1,000 miles, the rocker will rust under the shaft. When that happens the solenoid-switch plunger can't return to its release position after torque control has cut off the engine (because of too much line pull). The fuel supply is automatically shut off at the injector pump, and you'll wonder why you can't re-start the engine.

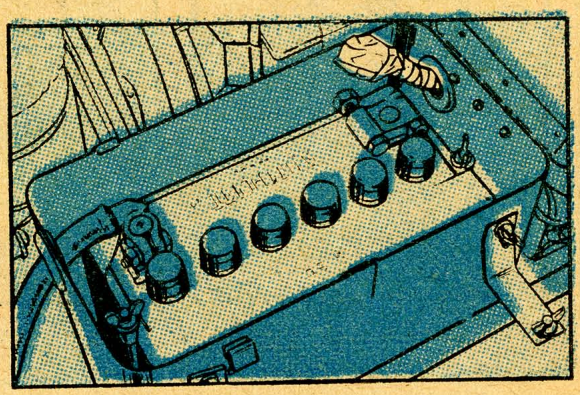
Little chores, like the man says, stave off big ones.

24-VOLT PRECAUTION

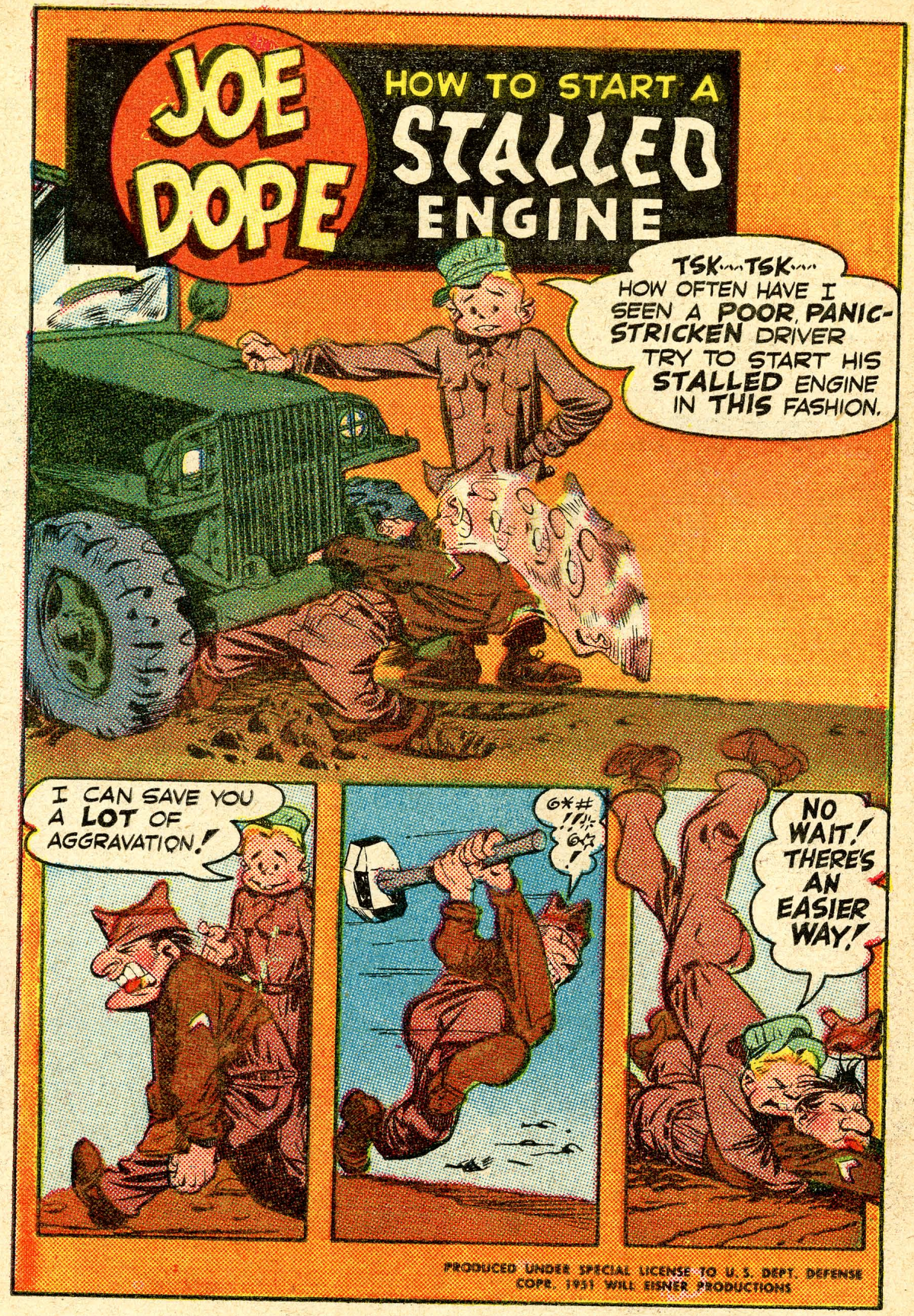
You Joes are always up to such foolishness it's a wonder li'l ole Connie has a blonde hair left in her head. Working around those **24-volt systems** without disconnecting the hot wire from the battery. Tsk, tsk. I sometimes think you do these things just to devil me.

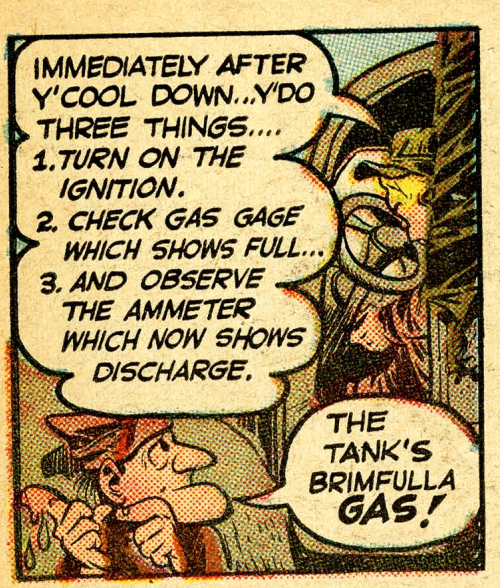
I'll have no more of it, see!

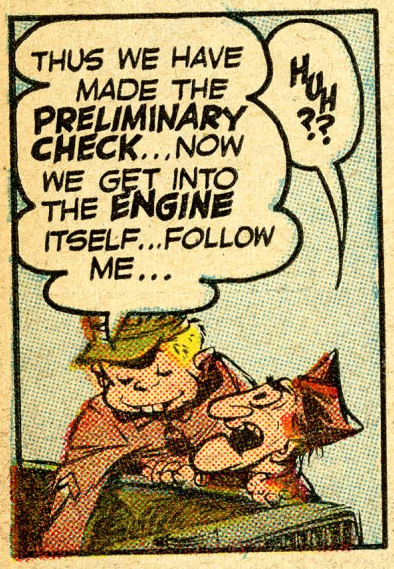
Here's a picture to show you **what** to do, and to make sure you remember it I'm sending you a decal that'll say: DISCONNECT BATTERY LEADS BEFORE WORKING ON GENERATOR OR REGULATOR INSTALLATIONS. DISCONNECT GROUND LEAD FIRST. Connie just can't believe you didn't know what a fire hazard this is.

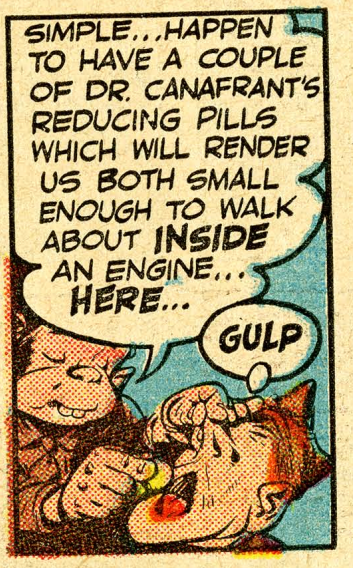


ULP, a typo . . . PS #1, P. 33 1/2" stainless rod should be 1/8"

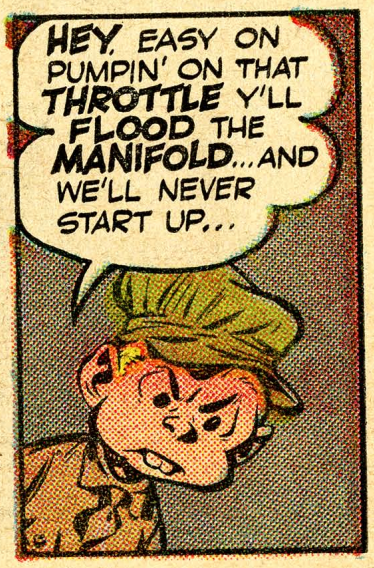

JOE DOPE
HOW TO START A STALLED ENGINE
TSK...TSK... HOW OFTEN HAVE I SEEN A POOR, PANIC-STRICKEN DRIVER TRY TO START HIS STALLED ENGINE IN THIS FASHION.
I CAN SAVE YOU A LOT OF AGGRAVATION!
G*#!/!:G*!
NO WAIT! THERE'S AN EASIER WAY!
PRODUCED UNDER SPECIAL LICENSE TO U.S. DEPT. DEFENSE
COPR. 1951 WILL EISNER PRODUCTIONS

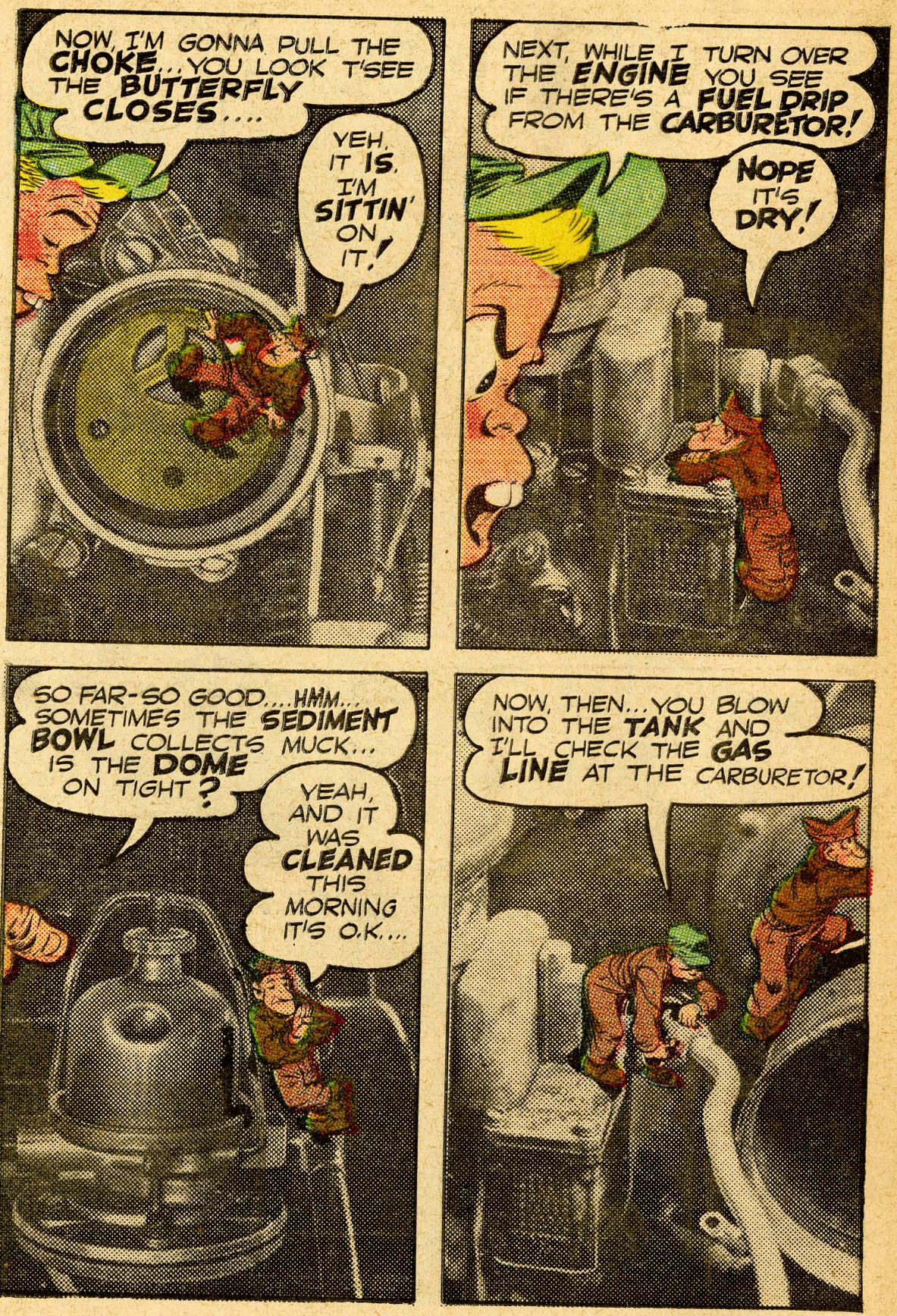




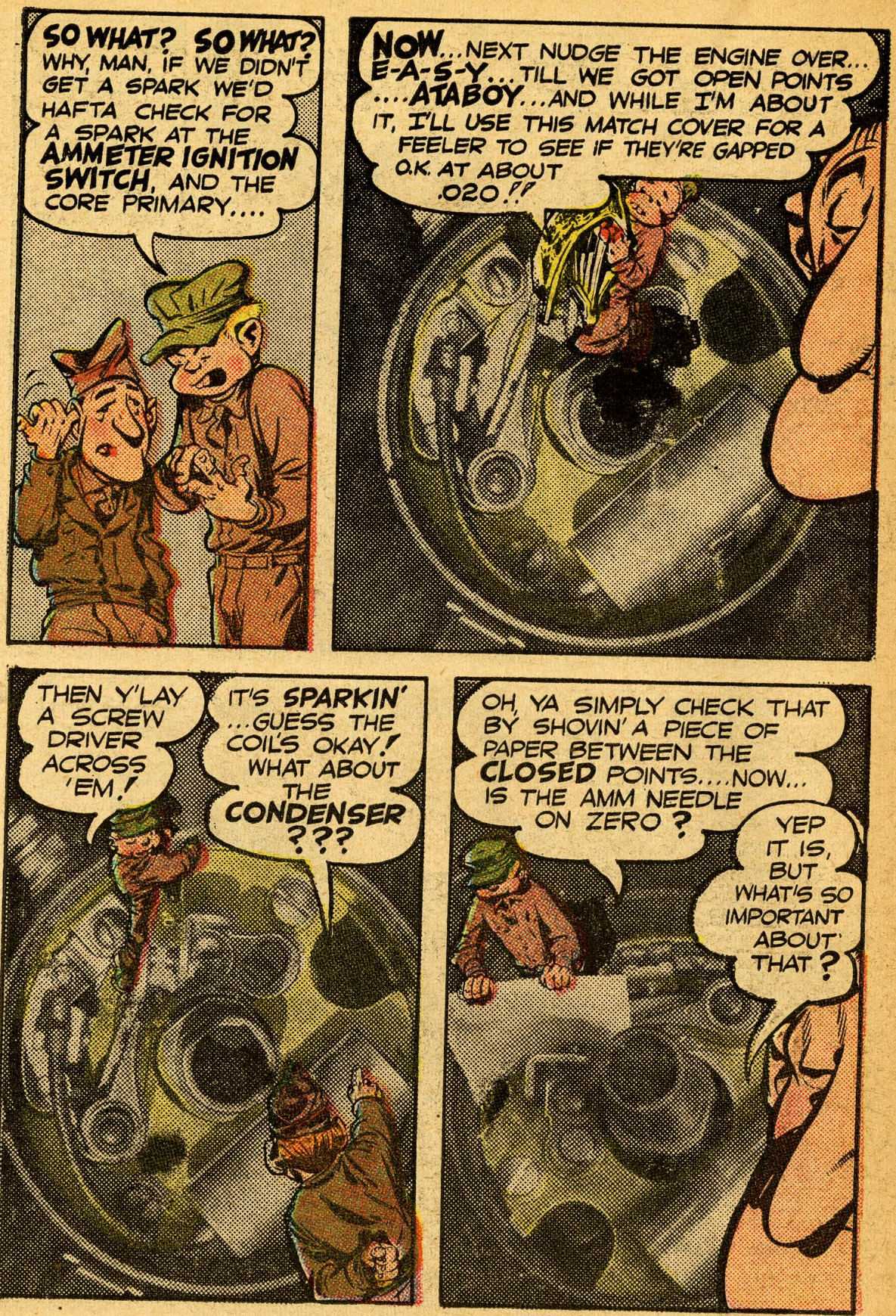


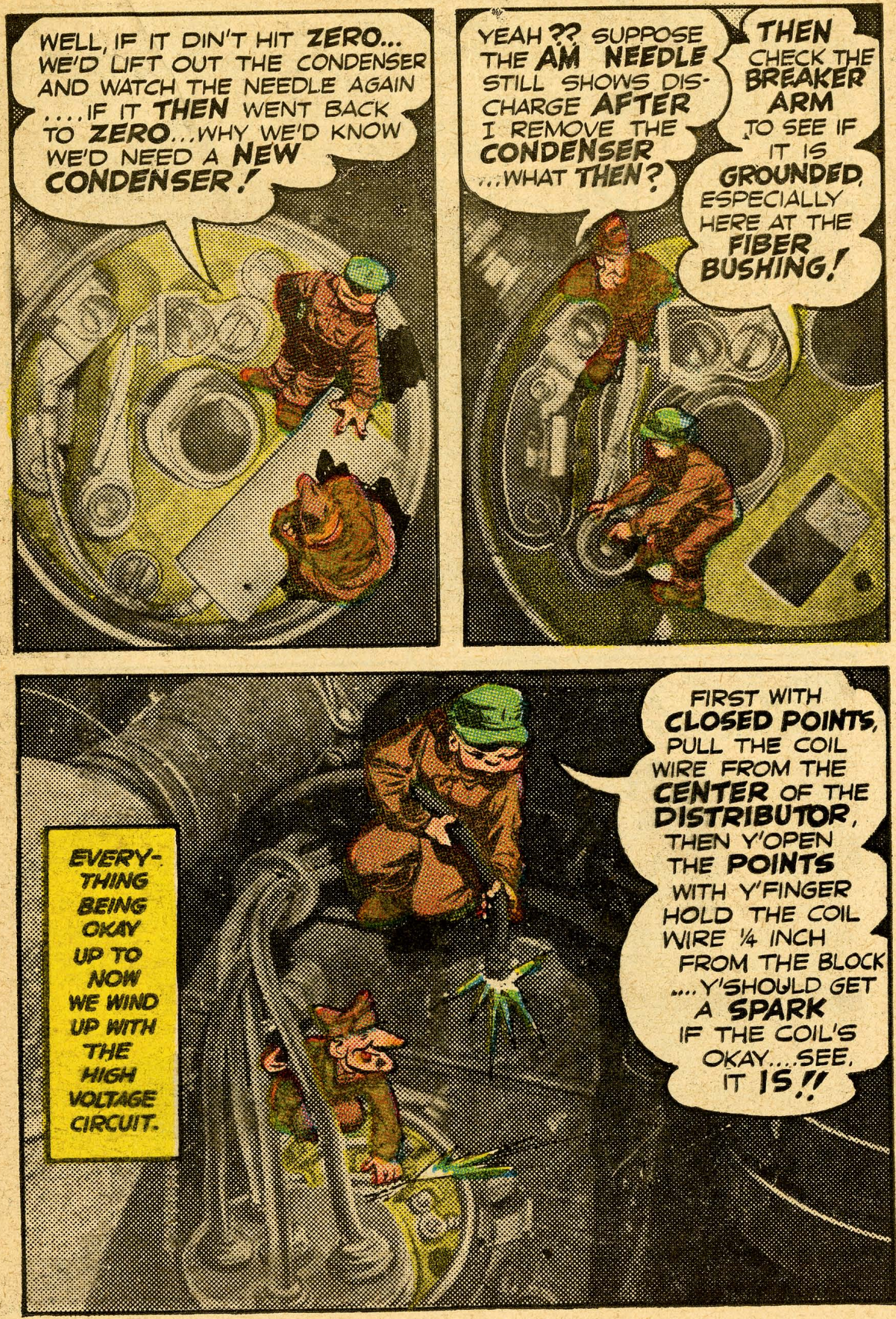
INSIDE THE ENGINE... TRY THE FUEL SYSTEM FIRST

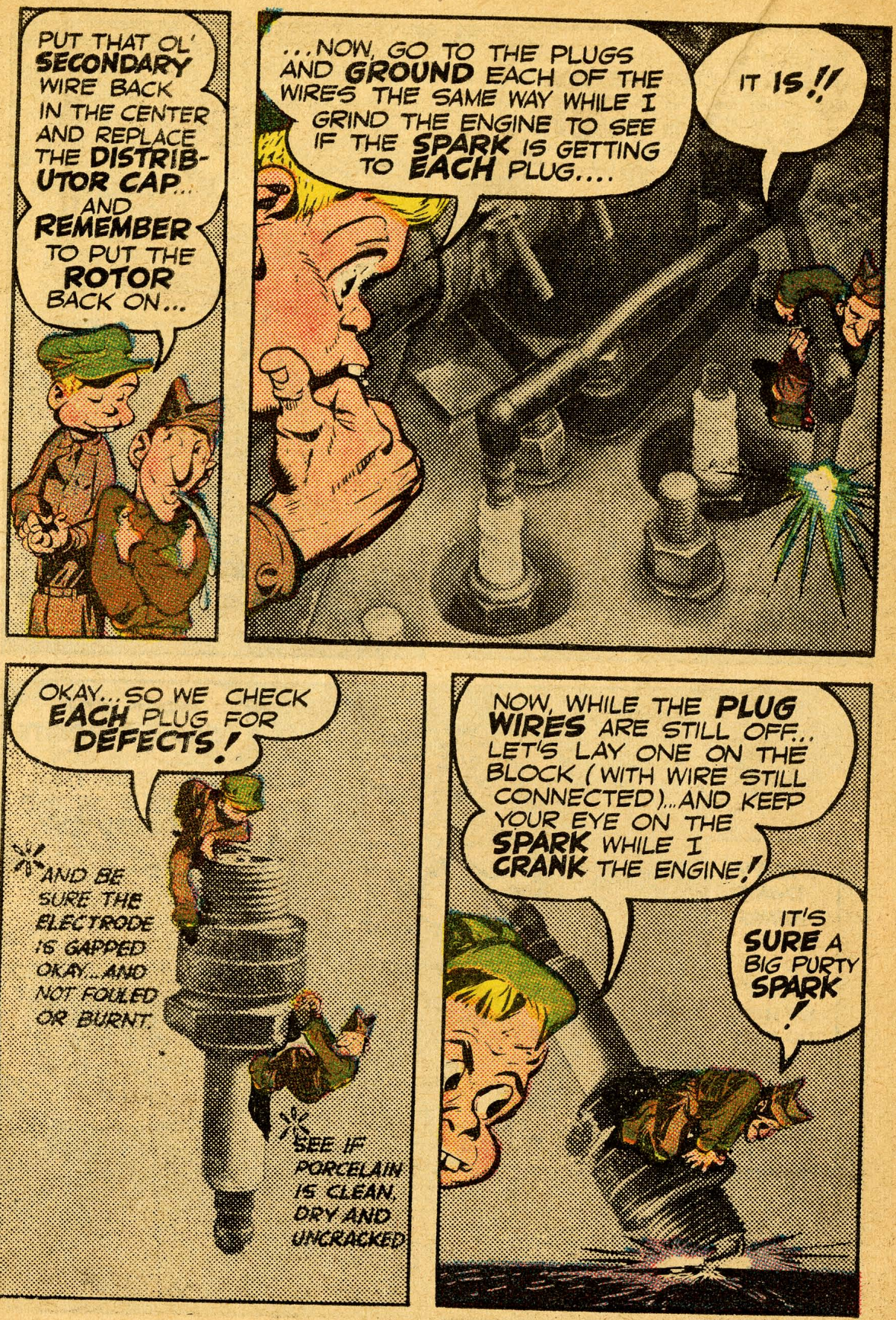


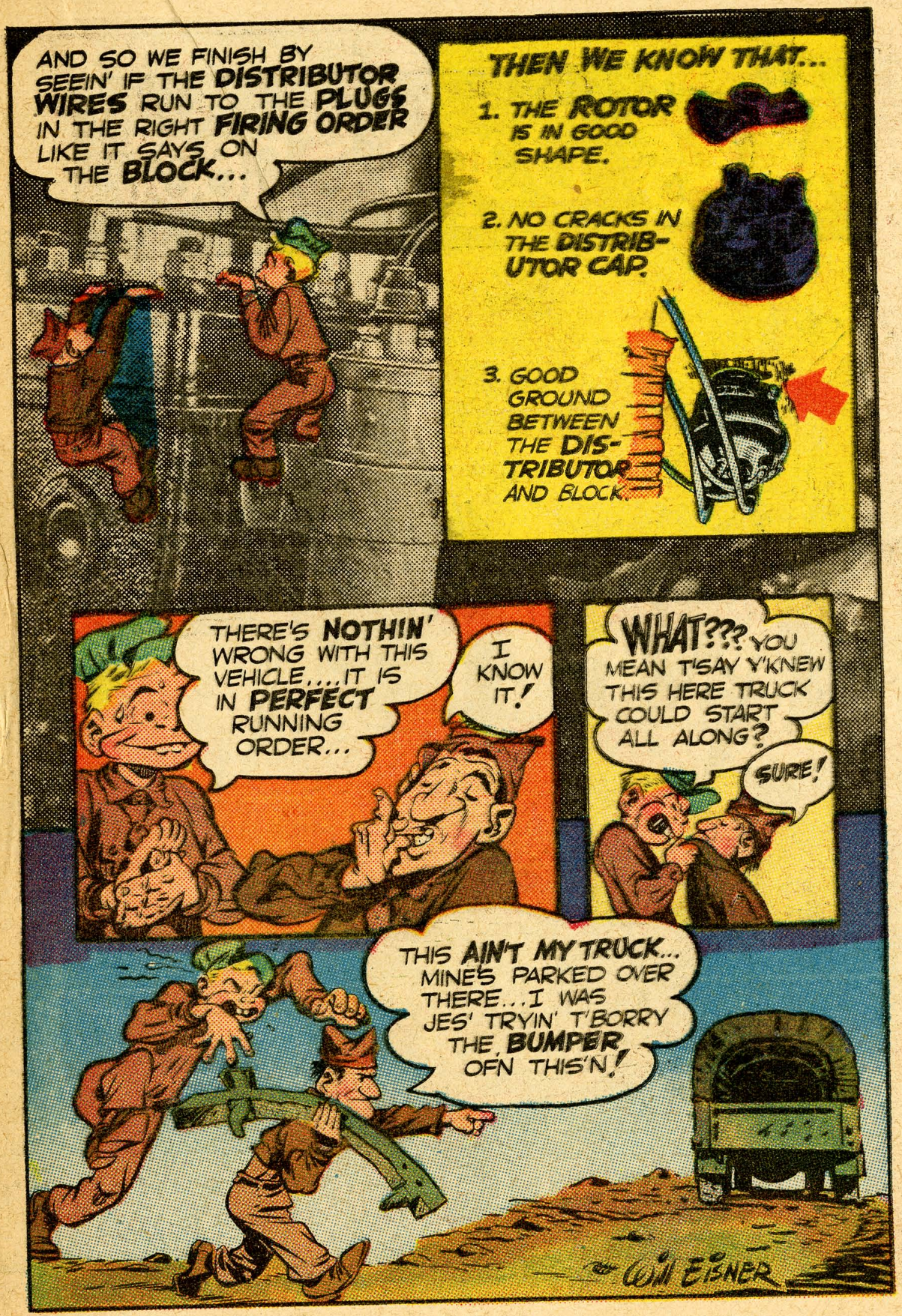

NOW, I'M GONNA PULL THE CHOKE...YOU LOOK T'SEE THE BUTTERFLY CLOSES....
YEH, IT IS, I'M SITTIN' ON IT.!
NEXT, WHILE I TURN OVER THE ENGINE YOU SEE IF THERE'S A FUEL DRIP FROM THE CARBURETOR!
NOPE IT'S DRY!
SO FAR-SO GOOD....HMM... SOMETIMES THE SEDIMENT BOWL COLLECTS MUCK... IS THE DOME ON TIGHT?
YEAH, AND IT WAS CLEANED THIS MORNING IT'S O.K....
NOW, THEN...YOU BLOW INTO THE TANK AND I'LL CHECK THE GAS LINE AT THE CARBURETOR!

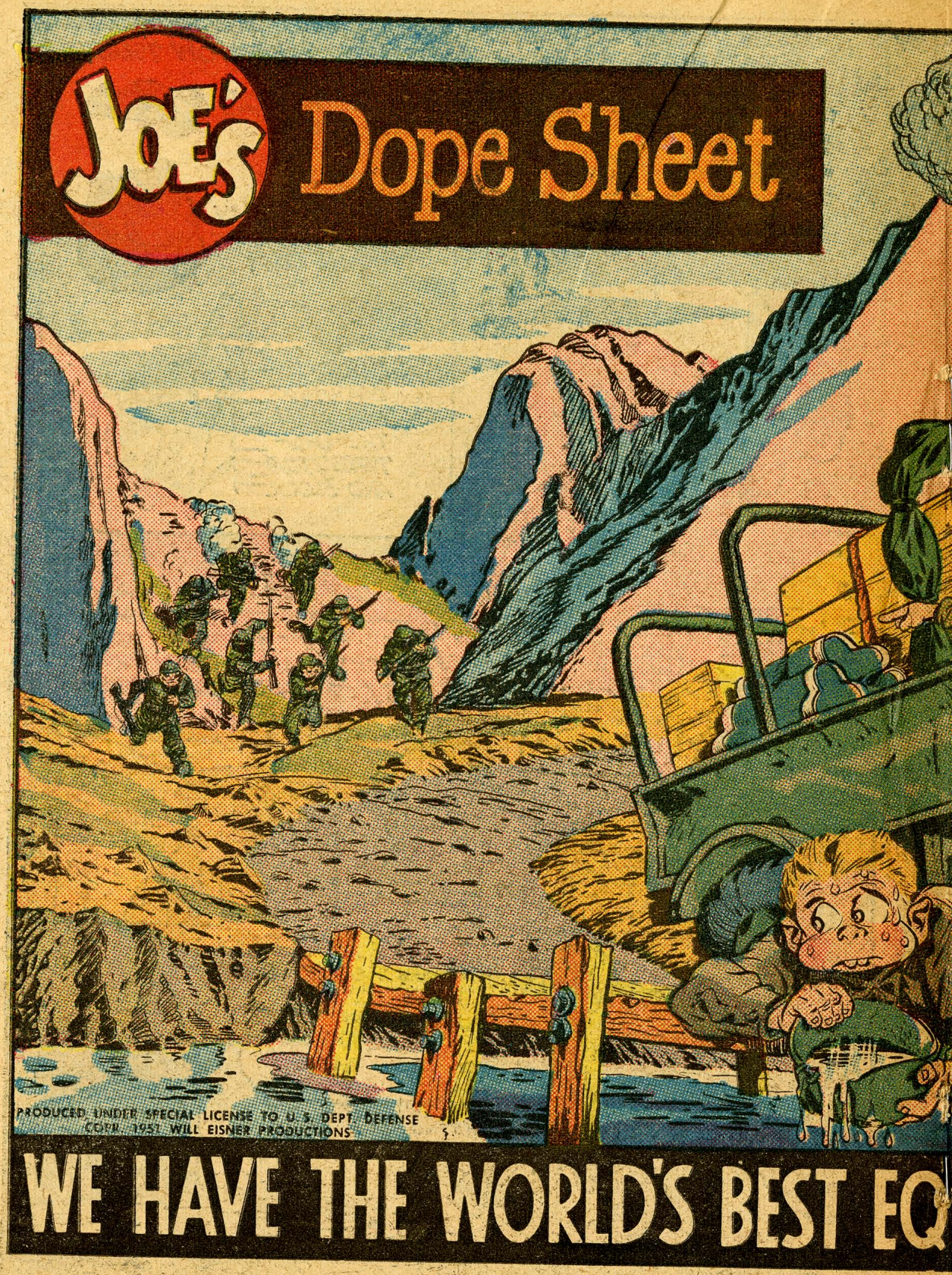
...THIS IS DONE TO SEE IF THE FUEL IS COMING THRU.... AHH... IT'S OKAY... Y'R OKAY UP TO NOW....
HEY..... WHAT HAPPENED TO YOU?
AFTER I BLEW I DREW... PTOOY
OKAY... NOW BACK TO THE IGNITION SYSTEM! CONSIDER THE OL' AMMETER AGAIN...
THIS SPARK I'M GETTIN' SHOWS THAT THE LOW VOLTAGE CIRCUIT IS OKAY FROM COIL TO AMMETER..... COIL TO DISTRIBUTOR... IT'S NICE TO SEE THAT THESE HERE POINTS AIN'T BURNT OR PITTED EITHER...
SUPPOSE Y'DIN'T GET A SPARK?
NOW GROUND THE COIL PRIMARY AT THE DISTRIBUTOR.
OKAY, OKAY. WE GOT A SPARK, SO WHAT?

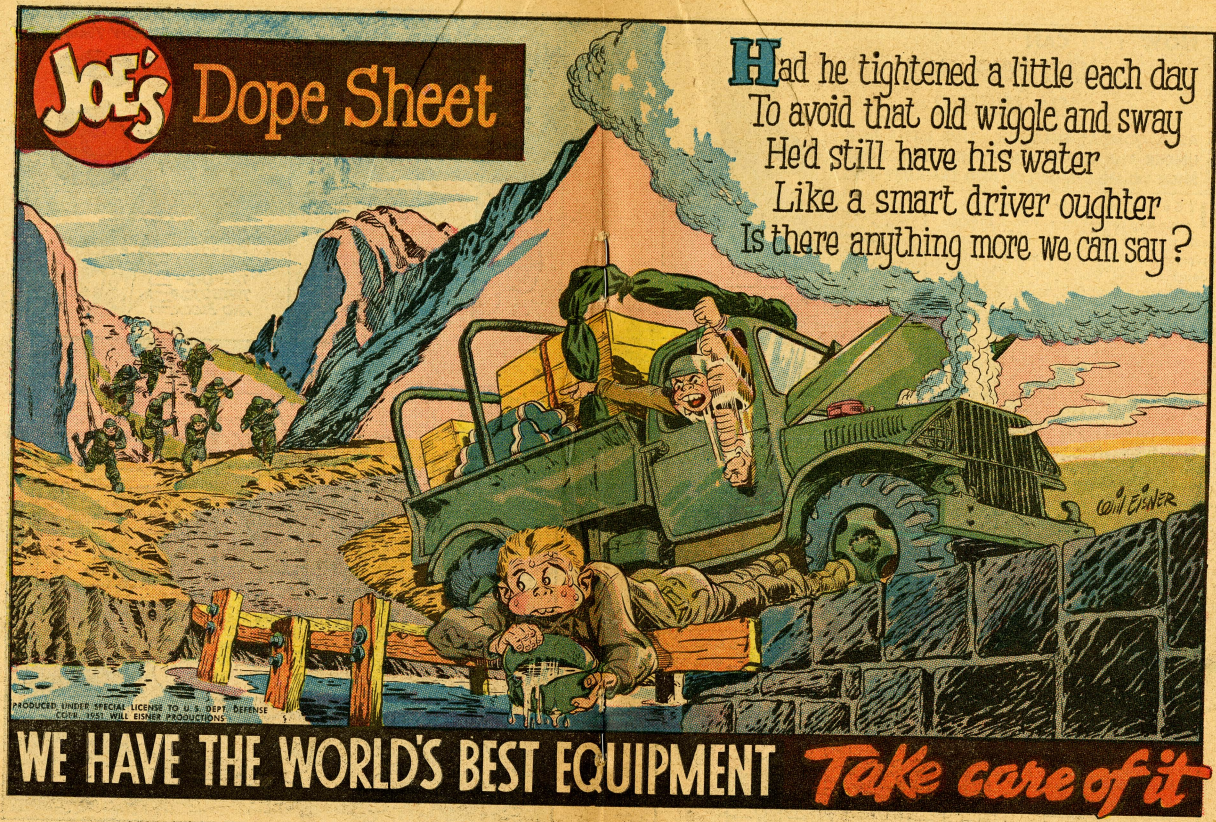

SO WHAT? SO WHAT? WHY, MAN, IF WE DIDN'T GET A SPARK WE'D HAFTA CHECK FOR A SPARK AT THE AMMETER IGNITION SWITCH, AND THE CORE PRIMARY....
NOW...NEXT NUDGE THE ENGINE OVER... E-A-S-Y...TILL WE GOT OPEN POINTS ....ATABOY...AND WHILE I'M ABOUT IT, I'LL USE THIS MATCH COVER FOR A FEELER TO SEE IF THEY'RE GAPPED O.K. AT ABOUT .020!!
THEN Y'LAY A SCREW DRIVER ACROSS 'EM!
IT'S SPARKIN' ...GUESS THE COIL'S OKAY! WHAT ABOUT THE CONDENSER ???
OH, YA SIMPLY CHECK THAT BY SHOVIN' A PIECE OF PAPER BETWEEN THE CLOSED POINTS....NOW... IS THE AMM NEEDLE ON ZERO?
YEP IT IS, BUT WHAT'S SO IMPORTANT ABOUT THAT?


WELL, IF IT DIN'T HIT ZERO... WE'D LIFT OUT THE CONDENSER AND WATCH THE NEEDLE AGAIN ....IF IT THEN WENT BACK TO ZERO...WHY WE'D KNOW WE'D NEED A NEW CONDENSER!
YEAH?? SUPPOSE THE AM NEEDLE STILL SHOWS DISCHARGE AFTER I REMOVE THE CONDENSER ...WHAT THEN?
THEN CHECK THE BREAKER ARM TO SEE IF IT IS GROUNDED, ESPECIALLY HERE AT THE FIBER BUSHING!
EVERYTHING BEING OKAY UP TO NOW WE WIND UP WITH THE HIGH VOLTAGE CIRCUIT.
FIRST WITH CLOSED POINTS, PULL THE COIL WIRE FROM THE CENTER OF THE DISTRIBUTOR, THEN Y'OPEN THE POINTS WITH Y'FINGER HOLD THE COIL WIRE ¼ INCH FROM THE BLOCK ....Y'SHOULD GET A SPARK IF THE COIL'S OKAY....SEE, IT IS!!


PUT THAT OL' SECONDARY WIRE BACK IN THE CENTER AND REPLACE THE DISTRIB-UTOR CAP... AND REMEMBER TO PUT THE ROTOR BACK ON...
...NOW, GO TO THE PLUGS AND GROUND EACH OF THE WIRES THE SAME WAY WHILE I GRIND THE ENGINE TO SEE IF THE SPARK IS GETTING TO EACH PLUG....
IT IS!!
OKAY...SO WE CHECK EACH PLUG FOR DEFECTS!
AND BE SURE THE ELECTRODE IS GAPPED OKAY...AND NOT FOULED OR BURNT.
SEE IF PORCELAIN IS CLEAN, DRY AND UNCRACKED
NOW, WHILE THE PLUG WIRES ARE STILL OFF.., LET'S LAY ONE ON THE BLOCK (WITH WIRE STILL CONNECTED)...AND KEEP YOUR EYE ON THE SPARK WHILE I CRANK THE ENGINE!
IT'S SURE A BIG PURTY SPARK!


AND SO WE FINISH BY SEEIN' IF THE DISTRIBUTOR WIRES RUN TO THE PLUGS IN THE RIGHT FIRING ORDER LIKE IT SAYS ON THE BLOCK...
THEN WE KNOW THAT...
1. THE ROTOR IS IN GOOD SHAPE.
2. NO CRACKS IN THE DISTRIB-UTOR CAP.
3. GOOD GROUND BETWEEN THE DIS-TRIBUTOR AND BLOCK.
THERE'S NOTHIN' WRONG WITH THIS VEHICLE,...IT IS IN PERFECT RUNNING ORDER...
I KNOW IT!
WHAT??? YOU MEAN T'SAY Y'KNEW THIS HERE TRUCK COULD START ALL ALONG?
SURE!
THIS AIN'T MY TRUCK... MINE'S PARKED OVER THERE...I WAS JES' TRYIN' T'BORRY THE BUMPER OFN THIS'N!
Will Eisner

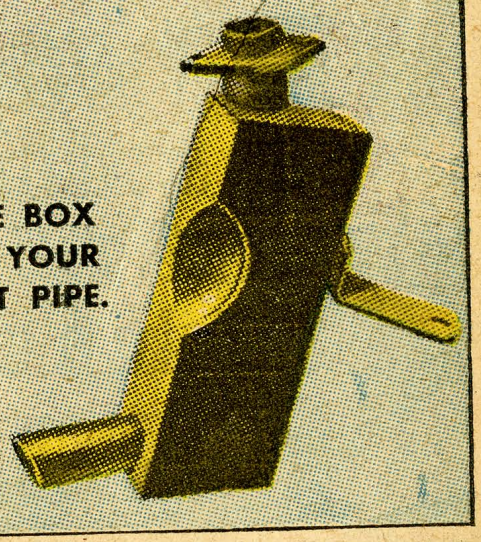

JOE'S
Dope Sheet
PRODUCED UNDER SPECIAL LICENSE TO U. S. DEPT. DEFENSE
COPR. 1951 WILL EISNER PRODUCTIONS
WE HAVE THE WORLD'S BEST EQ


JOE'S Dope Sheet
Had he tightened a little each day
To avoid that old wiggle and sway
He'd still have his water
Like a smart driver oughter
Is there anything more we can say?
WILL EISNER
PRODUCED UNDER SPECIAL LICENSE TO U.S. DEPT. DEFENSE
COPR. 1951 WILL EISNER PRODUCTIONS
WE HAVE THE WORLD'S BEST EQUIPMENT
Take care of it

UIPMENT **Take care of it**

NOW YOU CAN MAKE YOUR OWN JEEP MUFFLER

AS A COMBAT FIELD FIX, THIS LITTLE BOX UNDER THE HOOD PINCH-HITS FOR YOUR SHOT-TO-HELL MUFFLER AND EXHAUST PIPE.



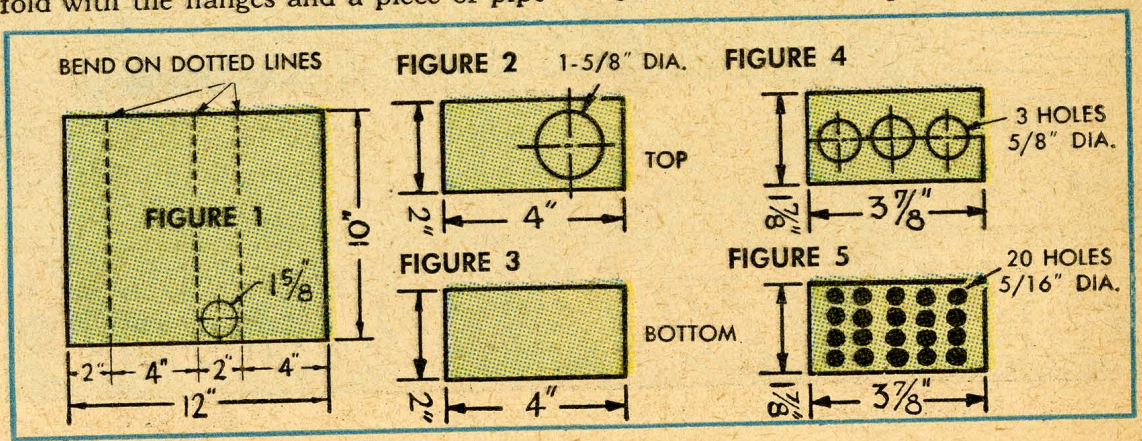
IT'S a tough deal—when you're jumping your jeep over stumps, stones, through salt water or deep mud—if the exhaust pipe and muffler hang up and tear off. A dangerous deal, too, if you have to operate without a muffler. Not only because of the racket from your vehicle and CO, but because a roaring, rocket-like arrival invites sniper fire.

One outfit in the field licked this problem on the ¼-ton by eliminating the exhaust pipe entirely and devising a muffler that tucks right into the exhaust manifold next to the engine and away from harm. This method, however generates more heat near the engine, and you'll have to watch for vapor lock (TB 9-803-FE3 dated 19 Oct. 1944 makes this fix official).

If you're in the same kind of spot—that is, constantly operating over rough stuff that knocks the exhaust pipe and muffler to pieces—here's how you can make your own. This improvised muffler is a metal box attached directly to the exhaust manifold with the flanges and a piece of pipe from your original exhaust pipe, a bracket to fasten it to a mounting, and a sawed-off tail-pipe. You'll need welding equipment, a 3/8" drill, a hammer and chisel or cutting torch, a bolt and nut, and some small scraps of sheet metal (10" x 12" is the biggest piece. You can use old grease cans or something similar).

Lay out your sheet metal and cut a piece 10" x 12". Measure 7" from the right edge of the 12" width of the metal and drill a 1 5/8" dia. hole (see Fig. 1) about ¼" from the bottom. The tailpipe'll fit into this opening. Then form the sides of your box (Fig. 1) by bending the piece of metal at right angles (over a sharp edge, like a vise) to a shape 10" long, 4" wide, and 2" deep.

Cut out two 2" x 4" plates (see Figs. 2



and 3) for the top and bottom of your box. In one plate, drill a 1⅝" dia. hole (Fig. 2) so the edge of it is about 3/16" from the end of the plate. This provides the opening for your flange and pipe. Cut two more plates, both 1⅞" x 3⅞" (see Figs. 4 and 5). In plate #4, drill three ⅝" holes; in plate #5, drill twenty 5/16" holes. These plates'll fit inside the box, and the holes are what'll baffle the sparks and muffle the sound of your exhaust.

You're ready, now, to make a muffler out of the box (see Fig. 6). Take plate #5 (with twenty holes) and weld it securely inside the box 3" from the bottom end (this is the end of the box with the 1⅝" dia. hole). Then weld plate #4 (with three holes) on the inside of the box 2" from the top. You inclose the sides by welding plate #3 on to the bottom of the box and plate #2 on the top (with the hole in the plate to the same side as the hole in the bottom of the box.)

Here's how you make the tailpipe (Fig. 6). Get a piece of pipe 1⅝" dia. x 3½" long (or make the pipe by welding a piece of sheet metal together), and flatten one end to a ⅜" opening. Weld the round end of the pipe to the 1⅝" dia. opening in the bottom of the box.

You need the hollow in the muffler (Fig. 6) so it'll fit around the oil pump with a ¼" air-passage clearance. Make this depression 3" in length, 2½" from the top of the muffler and 4½" from the bottom. It should be 1¼" deep in the center and extend in width from ½" from the tailpipe side to within 2½" from the edge of the other side. You can make it two ways: either cut out a piece of the box according to the dimensions, then reshape it to form the hollow and weld it back in; or you can heat the box where the hollow is to be formed and pound it in with a hammer.

Take your old exhaust flange and pipe and cut it off 3" from the top. Place the end tailpipe in the top of the box. Before welding it, however, you'll have to try it in the exhaust manifold to find exactly at what angle the pipe should be secured in the box.

For the bracket, cut a piece of band

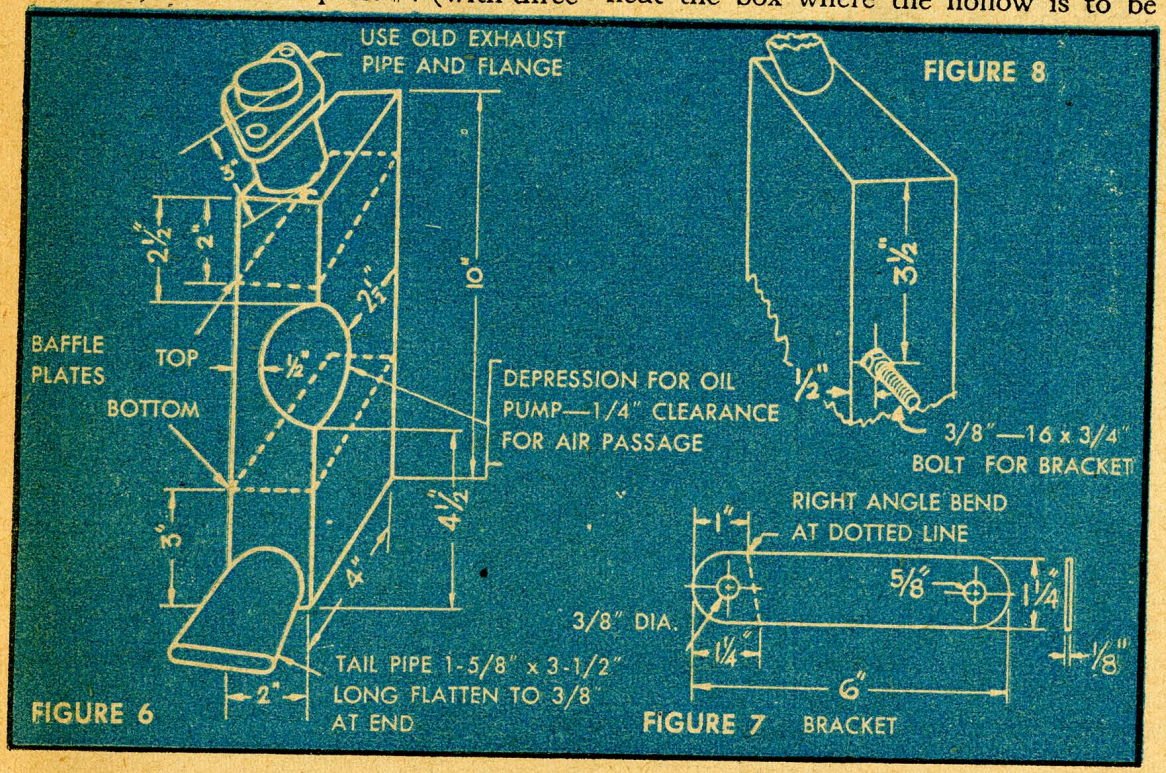


FIGURE 6

FIGURE 8

FIGURE 7 BRACKET

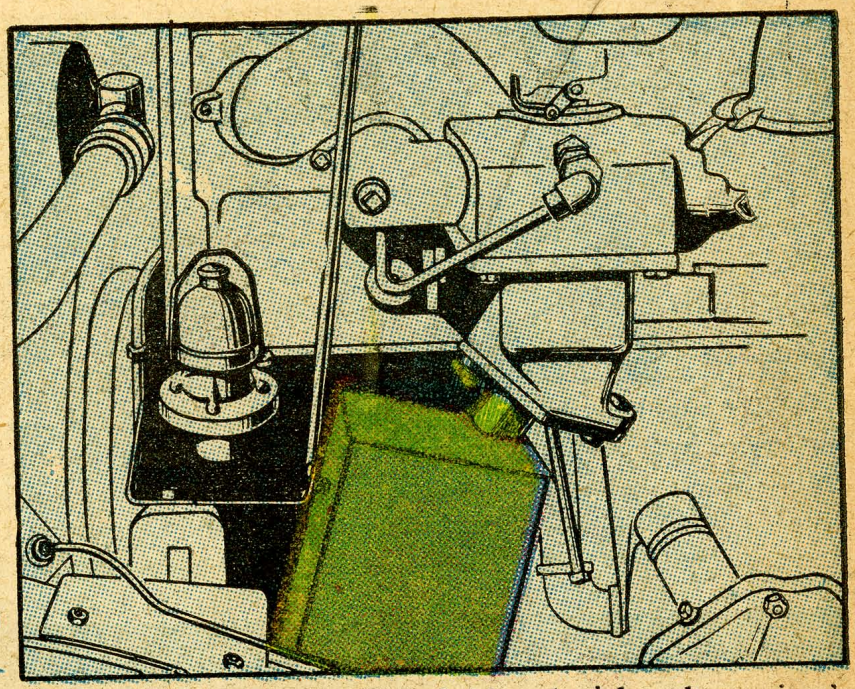
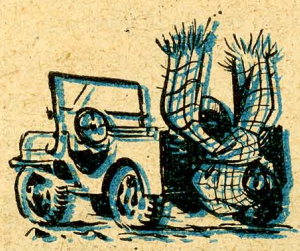


Fig. 9 — Now that the job is all finished you can double check your installation to see that the hook-up looks like this, and then you can be on your way, **quietly.**

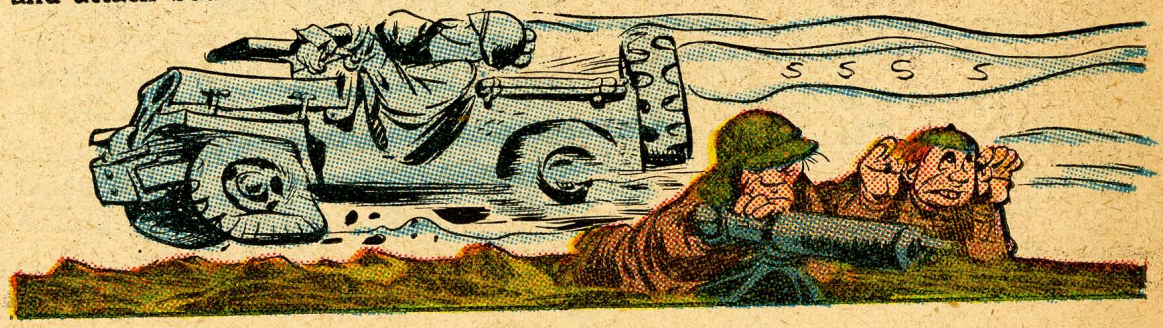


iron ⅛" x 1¼" x 6" (see Fig. 7). Then drill a ⅜" dia. hole in one end and a ⅝" dia. hole in the other. Make a right angle bend as shown (Fig. 7). Find a ⅜" x 16-thread x ¾" bolt and weld the head to the side of the box that's opposite the tailpipe (see Fig. 8), 3½" from the top of the box and ½" from the side. Attach the bent end of the bracket to the box with the bolt and a ⅜" 16-thread nut.

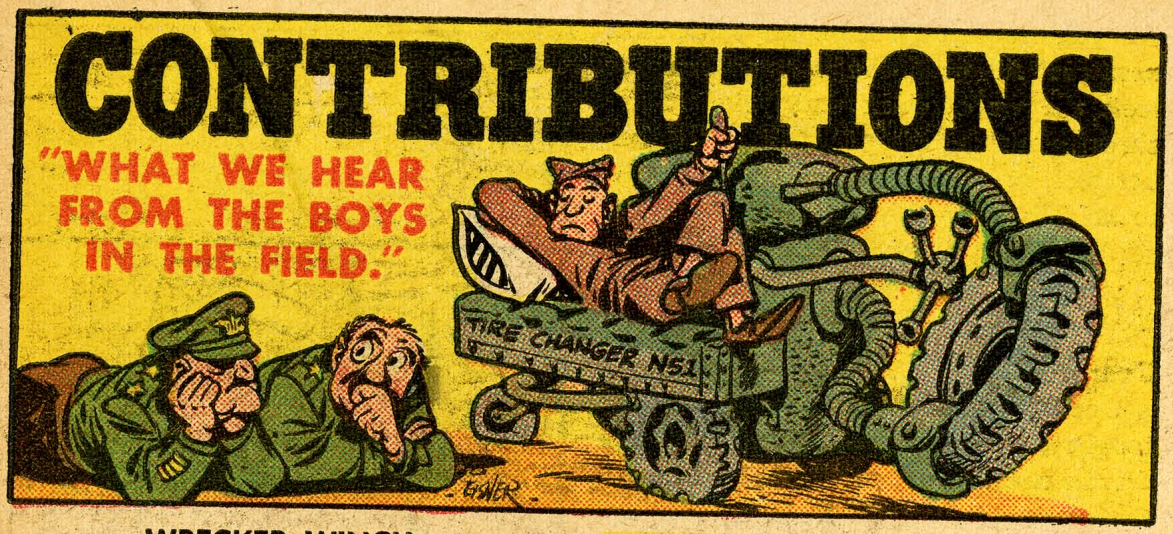
Now your muffler's done and ready to install. Attach the flange and pipe of the muffler to the exhaust manifold (see Fig. 9) as it was originally, using the same bolts and nuts. In order to fasten the bracket to the rubber mounting (under the fuel pump) remove the nut that holds the body support to the mounting, place the bracket end over the body support and attach both of them with the same nut. This finishes the job and your jeep's ready to go again—but quietly.

If you have trouble with heat from this muffler causing vapor lock in the gas lines, you can protect them with a shield. Make it from sheet metal, and for better insulation, fix a piece of asbestos on the side facing the muffler. Attach some sort of bracket to the shield and place it between the muffler and gas lines by fastening the bracket under a convenient nut.

A change was supposed to go into production on the ¼-ton. The pipe was then supposed to extend straight back with the muffler placed as high as possible, approximately under the rear seat. Also the bend was to be taken out of the pipe's flexible section, to make it more flexible and prevent some of the breakage and corrosion at this point.



CONTRIBUTIONS



WRECKER WINCH

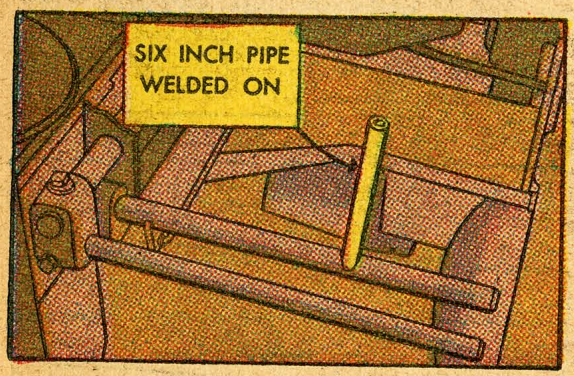
Dear Editor,

I drive a 4-ton Diamond T wrecker somewhere in the Aleutians and have a lot of trouble with the throttle control on the winch control-levers. Why not weld a piece of ½" pipe, about 6" long, on each control lever (see Fig. below) in order to accelerate the winch more easily?

Also, why not give the boom adjusting-cables (from the winch frame to the end of the boom) a paint job to keep them from rusting? Since the cables aren't wound, grease or oil wears off pretty fast.

Cpt. E. J. Boyd
Ord. Sv. Comp. Co.

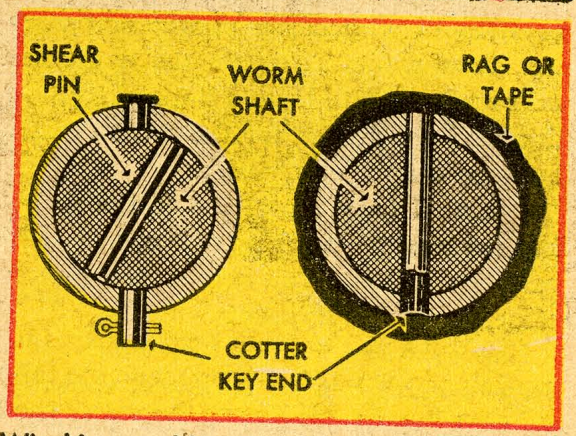
(Ed Note—Sure, why not? Go right ahead.)



SHEAR-PIN SHORTCUT

Dear Editor,

In the June issue of P.S., Sergeant R. H. Fortin had a suggestion for using a broken shear pin over again, by cutting the pin in two and inserting a wooden dowel between the halves of the pin. Some of our boys have fooled around with the same idea and found a couple tricks to make this job easier.



Winching problems being what they are in today's wars, here's a couple easy-do-its.

In case you don't have a hacksaw handy, just line up the two shafts and drive out part of the pin that's still in the worm shaft, **half way.** Start the engine under the same load and the pin will slice where you want it easy as butter.

The other suggestion does away with the wooden dowel. Usually, when the pin shears, the ends are peened to the propeller-shaft yokes. Pry the head of the shear pin out and line up the pin still in the worm shaft, with the hole in the yoke, then drive the cotter-key end into

the yoke and you'll have the same as a new pin. All you need is enough pin to lock the worm shaft and yoke at the shearing surface. Wrap friction tape, handkerchief, or an old rag around the shaft to hold the shear pin in place (see Fig.).

S/Sgt. William E. Demitruk
The Infantry School

DRIVER ROSTER

Dear Editor,

One of our Battalion Motor Officer's toughest problems was to keep his list of drivers same as 1st sergeant. And one of the sergeant's biggest headaches is the question of who has a permit and who can drive what. To settle the question, we usually had to have a battery formation and get drivers for the day's details by a process of elimination.

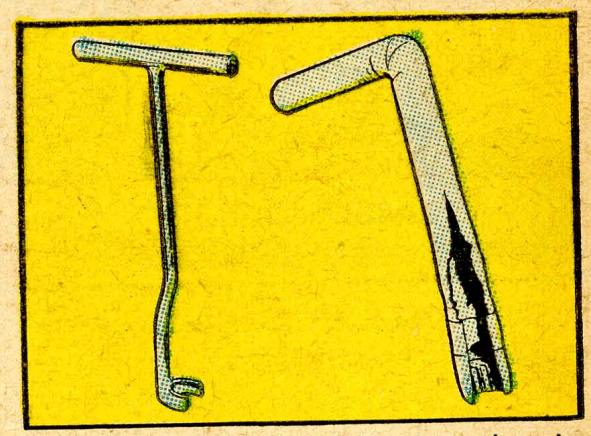
I think I have a solution to the problem (at least it's working out in my outfit very well) that will help other motor officers and 1st sergeants.

I have devised this chart, on which each driver's name can be inscribed, showing his rank, serial number, license number, different types of vehicles he's qualified to drive, whether he's a regular or an assistant driver, and the number of the vehicle to which he is assigned (see Fig.).

The chart can be stenciled and run off on a mimeograph to provide enough copies for the whole battalion. The motor officer can keep one copy and the 1st sergeant can keep one copy in the battery orderly room—this keeps close tabs on the drivers and vehicles.

Here's hoping it may be useful to your readers.

Lt. Allan Sobelman
342 Armored FA Bn.



Whether you make it slick like the tool on the left, or rough like the other one they'll both do the job neat and easy.

WIRE ADAPTER TOOL

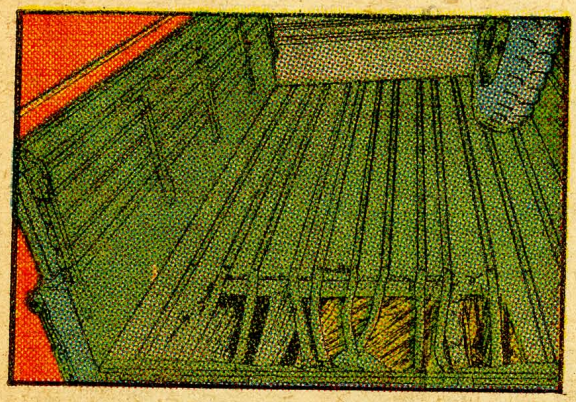
We have here two tools, either of which does an equally good job of lifting spark-plug adapters on the M4A3 Medium Tank without fuss and without breaking you know what.

The field-wrought version was wrought in the field by **M/Sgt. C. L. Cross** of 728th Ord. Co. The slick model was slicked up at The Ordnance School by **Sgt. Madison.** Instead of offering you your pick, all P.S. can say is make the one you can from what you've got handy, long as you make one.

MEN QUALIFIED TO DRIVE VEHICLES
_____ BATTERY
342ND ARMORED FIELD ARTILLERY BATTALION

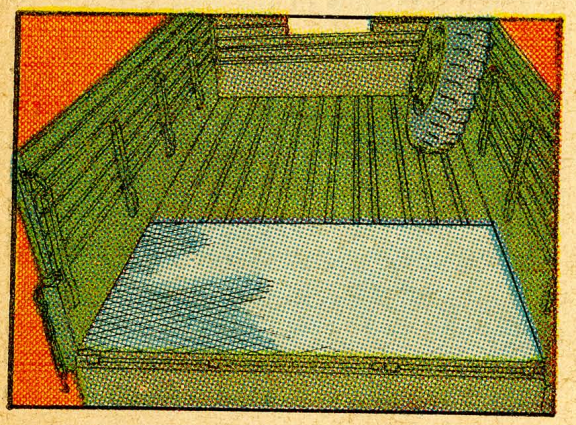
NAME	RANK	ASN NO.	LICENSE NO.	1/4 TON	2½ TON	HALF TRACK	LGT. TNK.	MED. TNK.	REGULAR DRIVER	ASSISTANT DRIVER	TYPE VEHICLE	USA NUMBER

Lt. Sobelman's driver roster



CARGO BODY FIX

From our already good friend **Captain Kenneth F. Searcy,** comes this field fix for beat up cargo beds, of which aplenty arrive at the 538th Ordnance Co. with their tailgates dragging after several skillion gasoline drums been whanged onto 'em from loading platforms. Takes a sheet of steel plate 48" x 80" x 5/16".



SHORTEN JEEP TUBES

Dear Editor,

During a recent maneuver, we had a lot of trouble with leaks in the cooling system of our jeeps—right where the hose connects to the top of the radiator. We think it's caused by engine vibration breaking loose the solder at the connection. Three inches off the metal tubing, and a longer rubber hose to replace the original, will fix it up.

"Boys of the C Battery"
297 AAA SL Bn.

JIMMY WINCH

Dear Editor,

The winch roller under the bumper on our 2½-ton 6x6 was frozen because it didn't get lubed. Awkward location of lubricating holes makes it impossible for the driver to lubricate with an oil can.

As it is now, we have to take off the bumper to free the frozen roller.

I recommend we put lubricating holes through the top of the bumper where the driver can get to them more easily. Measure nine inches outward from center of bumper, two inches from front (this will be in line with roller), and drill two holes just large enough to get the nozzle of the oil can in.

Sgt. Salvatore J. D'Andrea
170th F.A. Bn.

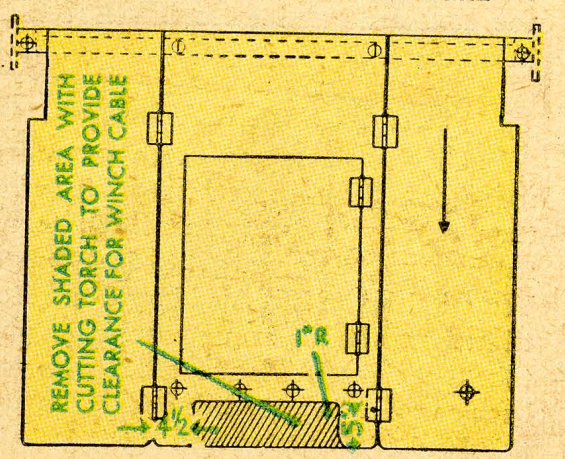
M32 WINCH CABLE CLEARANCE

Dear Editor,

Here's a sure cure for those of you who've been bothered with the winch cable on your M32 tank recovery vehicle scraping against the machine gunner's platform (with the cable's unwound down to the first layer).

TB 9-738 FE1 (3 Jul 44) says to cut a strip about 5" wide off the rear of the platform—leaving at least 4½" on either end of the cut (see Fig.). It's about a five-minute job with a cutting torch.

Pvt. Victor Schwartz



SEEMS whenever two or more G.I.'s get together, the conversation sooner or later gets around to the M46 electrical system. Seems so few of us know quite what it's all about. 'Specially dat ole debbil Master Junction box.

At least one exception is Sgt. Madison, who tells us a couple ways how to get under way again when the batteries are low and the master relay won't close in spite of our choicest language.

If there's a slave-kit handy, you've no real problem. You hook it direct to one set of batteries, plus-lead to plus-terminal on one battery in the top set, minus-lead to minus-terminal on the other battery of the top set. All four batteries will get the charge and the relay will click shut. Then you can bring the gravity up by running the auxiliary generator and you're back in business.

LOW VOLTAGE EXPEDIENT

But if you're stalled out on a country road somewhere beyond slave-kit territory, and your date won't listen to no more excuses, then you got to do different. You wind up on Mr. Auxiliary Generator til he hums on his own power. Then you take that eight-foot length of #16 wire you been carrying in your side pocket for just this kind of excursion and cut it in half. Fasten one piece to the output side of Mr. A. G. and the other piece to one of the plus terminals on the battery set. Then at a safe distance from the batteries, flash the two free ends of the wire together to cause a quick short. Some people, who never saw a battery explode from a hydrogen blast, have been flashing direct on a battery terminal. P. S. hopes you take the hint. Notice the word **flash.** The short you've caused will send a quick fever of about thirty volts through the system and should close the master relay switch.

If not, flash again until it does close, which it will do sooner or later unless something else is out of whack. Like a line switch or regulator.

In any case, when that master relay is

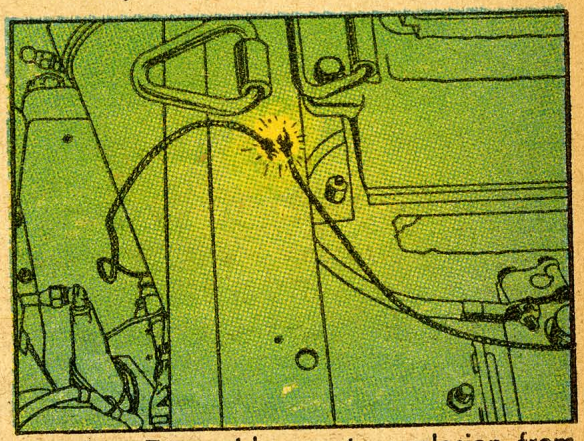
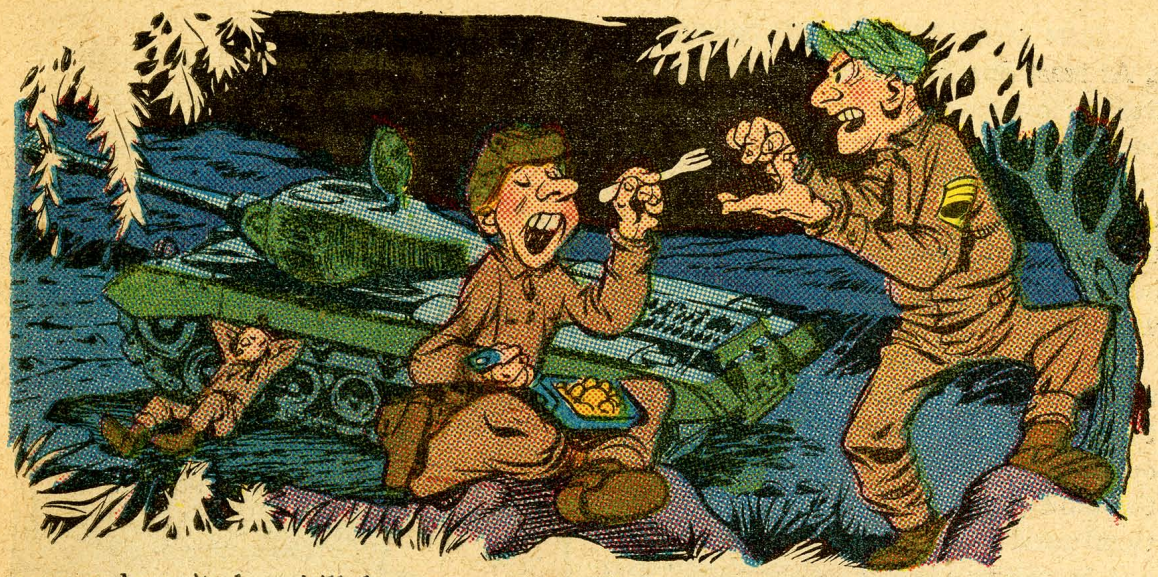


Fig. 1 — To avoid a nasty explosion from hydrogen gas, flash the wire in open air.



open and won't close, it'll do you no good to hook the slave kit into the slave receptacle on your M46. If you're driving an A1 model though, the new rectifier will close the relay as soon as you hook up and turn on the juice.

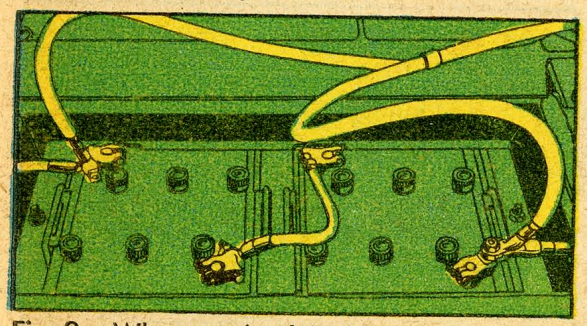


Fig. 2—When you hook in the slave kit direct, it's plus-to-plus minus-to-minus.

BATTERY DRIP

Because the batteries are in just about the hottest section of the engine compartment, and because they usually get their drink of water when they've cooled off, they may develop an annoying habit of foaming their electrolyte all over the neighborhood when you're running.

The strictest kind of maintenance won't keep some of that acid from messing your wires and eventually will put the whole electrical system out of order. Until something better comes along, most crews are rigging a drip pan, which they make out of a #10 can, to shield the junction box. Then they wipe the tin shield clean whenever they get the chance.

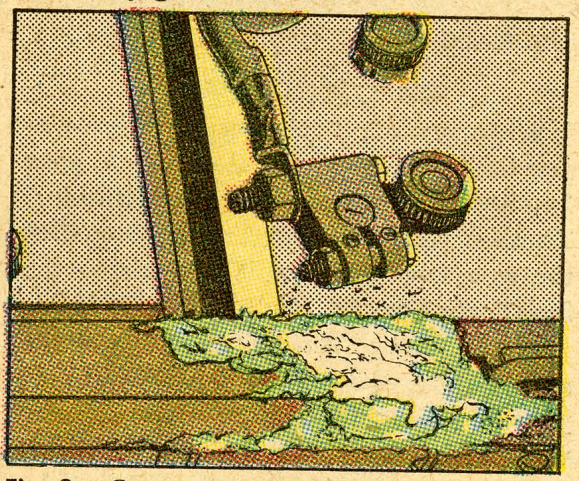


Fig. 3—Corrosion here tells you for sure that plenty's dripped on the junction box.

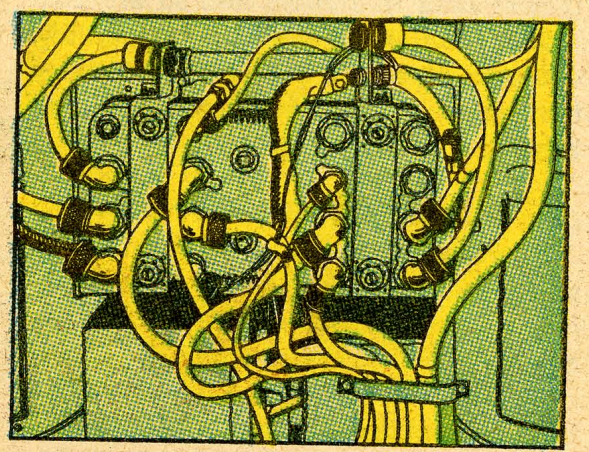


Fig. 4—And pretty soon these handsome terminals'll look like rats been at 'em.

GUN LOCK BREAKS QUADRANT

At least one M46 in every family has had its quadrant busted because somebody left the inside gun-lock handle lolling on the breech-guard ring. Then when the gun is elevated a couple degrees and the ring moves out from under the lock handle, smash goes the quadrant. And you with no spare.

Some outfits been cutting an inch-and-three-quarters off the hand grip section of the handle so when it flops it misses the quadrant. But that lops off leverage at the same time and makes it even tougher than usual to lock and unlock the gun.

A better way is to heat the handle and bend it like in the drawing. Then you've still got your leverage and your quadrant too. Good deal?

OIL COOLING FANS

When you see the engine and transmission heat climbing way out or reason, your first notion is that the fans aren't running. That's right. Your second notion is to flick the re-set on the circuit breaker so the fans'll start again. THAT'S WRONG!

If you engage those fans with the engine running above 1000 rpm's you'll bust your fan-drive shafts every time. Usually when the fans kick out it's because one of them is in trouble. When you shear the shaft on the other one by being too hasty, they're both in trouble and so are you.

MORAL: When the heat goes up idle down to a creep . . . or even better **stop** the engine . . . before you reset the circuit breaker.

PHONE BOX DOOR-HANDLE

If and when the stud pulls out of the phone-box-door handle on your M46, here's how to fix it so it won't happen again!

Drill the old hole with a five-sixteenths bit, tap new threads, and put it together with shakeproof combination bolt #H101-019-2417. Better take care of that right away too—never know when some blonde War Correspondent named Maggie might come sliding down your cellar door.

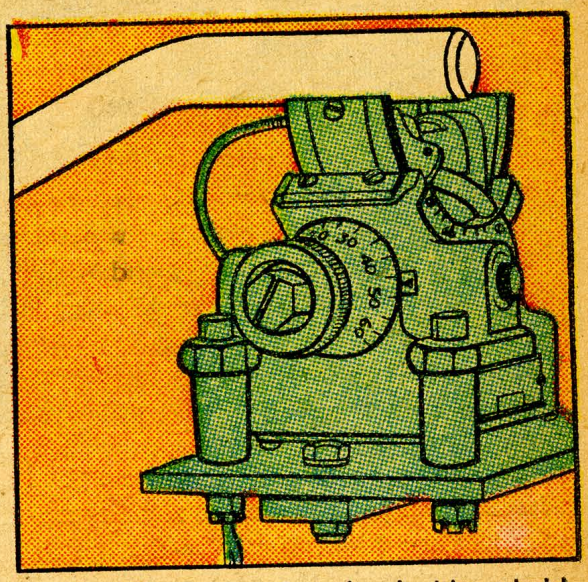


Fig. 5—Elevate gun from level without holding lock handle—goodbye quadrant.

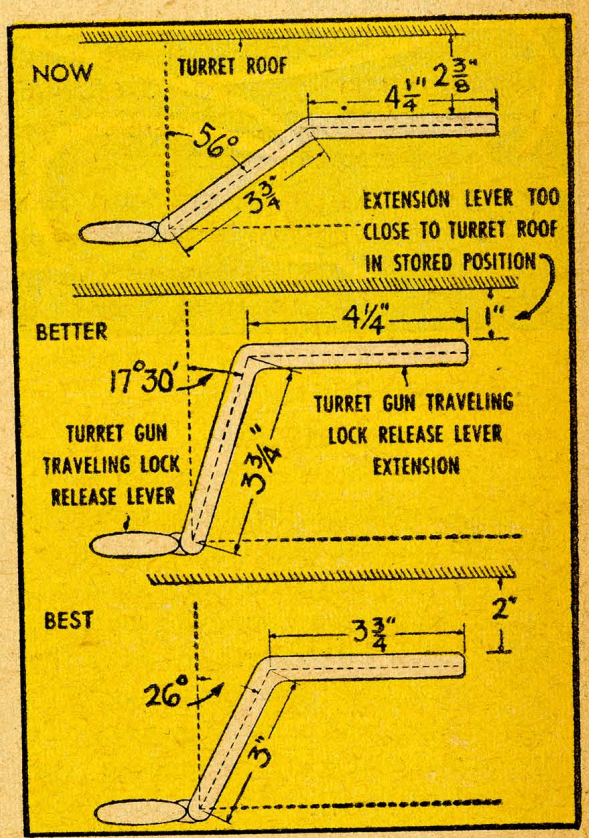


Fig. 6—This new twist that you can bend with a torch, will let the handle clear the quandrant. Shown here in locked position.

(continued from page 54)

flywheel housing prior to each flycasting excursion with your Beaver.

OUTSIDE AND AROUND

To begin at the front, we find a steering-knuckle boot that may on occasion need to be replaced with a new steering-knuckle boot, or else we'll find ourselves replacing steering-knuckle assembly himself because we left on a split boot that let in a share of water and grit. The Terra Haute Ordnance Depot will gladly channel you a kit #G742-7410883 containing one steering-knuckle boot #TD-A3280-P1602 and one tube of water-sealing compound #TD-1199-D-1460 for smearing over the zipper. Remember, we said order the **kit** . . . not the boot or the compound separately, for the slightly alarming reason that if we order the boot separately by the above number, we stand a fifty-fifty chance of getting ourself a old dry-rotted half-track boot that will neither fit nor will it keep out above mentioned debris.

Next we come back to the exhaust pipe, which you'll find to contain one less clamp than it had in the manual. Namely part #G742-7538680 (fig. 10) which was removed (or should have been) to keep from breaking manifold studs due to the flexible engine fighting the rigid frame-mounting.

Along that same line, you'll find that the tailpipes on some few M34's are not exactly in alignment to take the breather extension when you're all set otherwise to go afording. Before that time comes, as it must to all M34's, get out a snorkel tube, and using it for a fixture, adust the tailpipe and secure it in the exact position that will let it mate with the snorkel when the time comes for said mating .

Moving up now to the gas tank, we find ourself under real (pun) pressure. This gas tank, which is normally expected to build up four-or-so pounds of pressure to help the gas along its way to the fuel pump, and to keep water out of the breather, has on occasion been known to build up considerably more than four-or-so pounds of pressure due to an occasional relief valve that didn't relief. Giving several unwary operators an unexpected dry cleaning. Bearing this in mind, especially when wearing your parade suntans, you will want to open yon filler-cap slow and easy. And to help you remember, even on your difficult days, a decalcomania is on the way, which in rampant black gothic on a yellow field will say PRESSURIZED — OPEN SLOWLY. When it arrives looking like figure 11, you will please to apply it to your M34 gas cap.

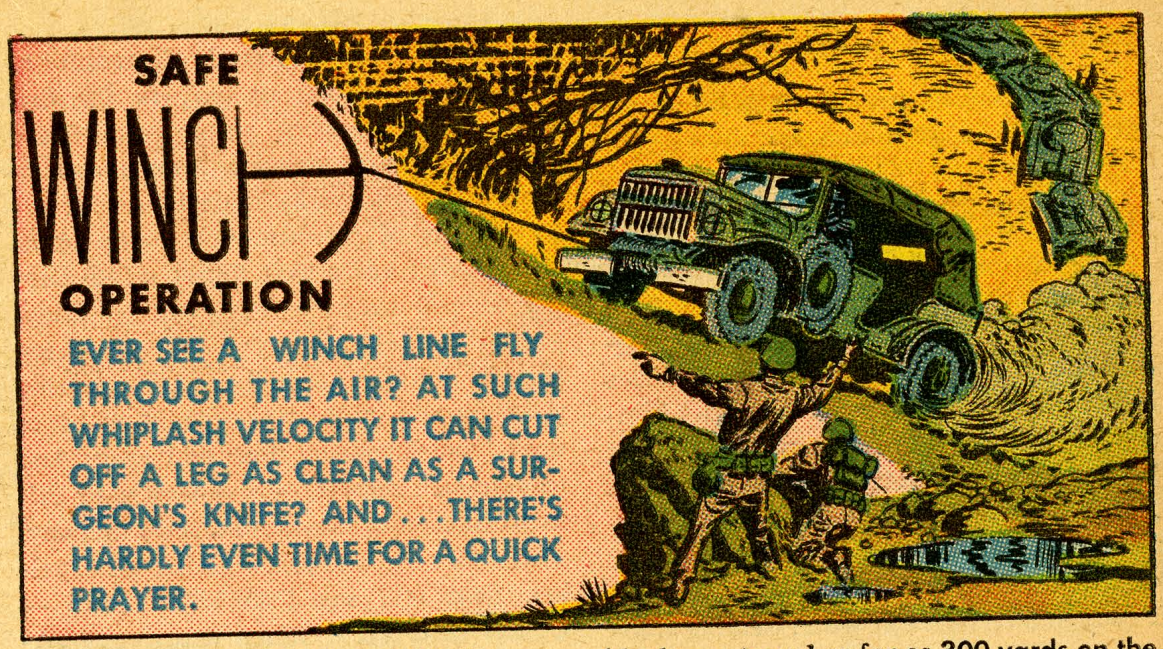
REAR WHEEL BEARINGS

Bending the knee now in the direction of our wheel bearing assemblies, we find some people locking the bearing-adjusting nut by bending the washer with hammer and chisel (fig. 12). Or hammer and drift. Or just hammer. This, children, is how we manage to use up so many M34-wheel-bearing oil seals. And that's a fact. Evvy time you smack that locking washer you got to smack that oil seal, and whether it shows or not, you've sure as hell busted same so it no longer can seal no oil. So take it gentle and easy, will yuh? Use a plier like in figure 13 and figure 14, with one jaw on the washer and one jaw in the axle tube. It'll save you meeting up with that same set of wheel bearings for the next 12,000 miles.

While you've got the hub and wheel off for whatever reason you've got it off, please take a look at the brake assembly to see if it's been painted. That is before you clean and grease the bearing assembly and hub. If it hasn't been painted, get

(continued on page 81)

SAFE WINCH OPERATION



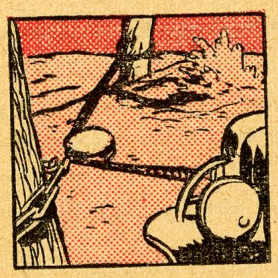
EVER SEE A WINCH LINE FLY THROUGH THE AIR? AT SUCH WHIPLASH VELOCITY IT CAN CUT OFF A LEG AS CLEAN AS A SURGEON'S KNIFE? AND . . . THERE'S HARDLY EVEN TIME FOR A QUICK PRAYER.

THEY STRETCH LIKE RUBBER

A winch line under load stretches like a rubber band and stores up a lot of energy. In fact a winch line weighing anywhere from 50 to 200 pounds of steel is a **much better** spring than rubber. A broken winch line snapping back could be compared with a rifle bullet except that the bullet makes a fairly clean hole.

If you're in the driver's seat when it happens, duck down behind the cowl. The brush guard will stop it in most cases but a broken cable can do some funny things. Playing safe isn't being a sissy—the idea is to treat a winch line under strain with the same respect you would a loaded gun.

SNATCH BLOCKS



If a snatch block is being used, keep away from the angle made by the cable and the block. A winch line makes a swell sling shot. A 95 pound snatch block can travel as far as **300 yards on the fly,** and that's a lot farther than Babe Ruth could sock a 5 ounce baseball.

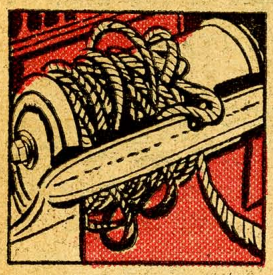
SHEAR PINS

For your protection a shear pin is provided on the worm shaft of every front-mounted winch. It will shear before a good winch line will break. The engineers specify that the pin must shear at not more than 10% above the rated capacity of the winch. **Use only standard issue shear pins to replace broken ones.** Using anything else may break a chassis frame, snap the winch line, or seriously overload the winch. A soft metal with special characteristics is used in shear pins so that the pin hole, the worm shaft or the universal joint won't be damaged when the pin breaks. Battlefield recovery calls for the broken parts to be driven out of the hole in a hurry. Which most often means a sloppy mud hole with a long line of trucks behind you waiting to get through. Let's learn while we can, to do it quick and easy.

Your truck came to you with two spare

shear pins. You should always check the supply of pins before you start on a trip. When a spare shear pin is used it should be replaced **that day.** The motor sergeant should keep a small supply of pins where they can be latched onto in an emergency.

WIRE ROPE



True, wire rope is the Prima Donna of the winch set up and is temperamental as Garbo, but it'll take plenty of punishment until it gets hit below the belt.

One of the quickest and easiest ways to ruin a length of cable is to put a kink in it. Keep your eye peeled for kinks starting to form, and stop everything to unsnarl 'em. Only you and your eagle eye can keep the kinks out.

To get good long life out of a length of cable, wind it **tight** and **even** on the drum. A loose cable will jam down between its own next layer of coils and cut or even break the surface wires. This weakens the cable and will fix your hands so even Trushay won't help. It also spreads the strands so water can get in and rust out the guts of it.

REWIND UNDER LOAD

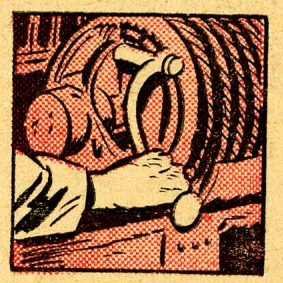
After using the winch, wind the cable on the drum with at least two men* hanging on the end to give it some tension. At the first opportunity completely unwind and rewind it under real tension.

The **best** way to do this is to fasten the end of the line to the front bumper of another truck that is directly in line with the winch. The driver of your tension truck should keep a slight, steady pressure on his foot brake to let the winch pull his truck. Winding the first layer is the most important. The coils of cable must be **tight against each other** so the coils on the next layer can't get a chance to jam down between them. As the cable winds, tap it on the side every few inches with a hammer and a block of wood. Otherwise you'll flatten the wires. After the first layer is wound right and tight, the rest is easy. Your main job is to guide it at the beginning and end of each layer, with the trucks kept in a nice straight line.

If you haven't got another truck handy, you can get the same result by fastening the end of your winch line to a tree and let the winch pull your lightly braked winch truck to the tree. (Boy, what a bag of tricks, eh?)

*P.S. Unless you've rigged your own friction-type cable guide.

WINCH DRAG BRAKE



Most complaints about the winch drag brake are made because it's just plain misunderstood. The drag brake is there for only one reason: **to keep the drum from spinning** when the jaw clutch is out and the cable is being run off. If you were to let the drum turn free, the cable would also fly free, get tangled and damaged.

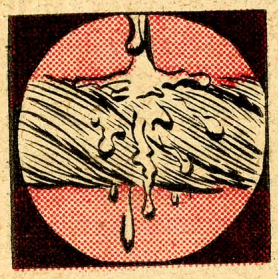
It's a very foolish man who ever tries to lower even a light load on the drag brake.

When the winch is not in use, leave the jaw clutch engaged* to keep the cable tight on the drum, and be **sure to lock the power take off in neutral.** Don't tighten the drag brake to keep the cable tight on the drum while the truck is being driven because you'll have a tough job pulling the rope off when you want to use the winch.

*Except on the M34.

If the brake doesn't work smooth and even, there's probably paint on the drum flange. Remove the paint from the part of the flange covered by the brake and it should handle smooth like a shell ejector.

EASY GREASY

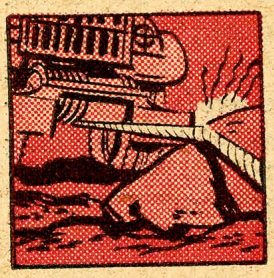


Whenever the winch line looks dry or shows signs of rusting (but why wait that long), give it a dose of engine oil. Crank case drainings do very well. When a rope bends there is a slight movement between the wires, and the oil will reduce the internal wear.

RIGGING

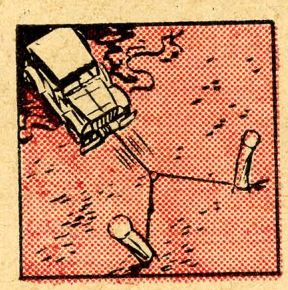
Anchoring the far end of the rope right is one of the main things. The right way is to slip the hook through the four feet of chain on the end of the cable. Unless you're an expert rigger, and few people are, it ain't good to fasten the cable to an anchor by tying the winch line, except in an emergency. The knot kinks and weakens the cable and it's almost sure to slip. And if you fasten the hook over the wire rope after you put it around a tree you're sure to bend and cut the strands.

APPLY LOADS SLOWLY



Always apply the load slowly. As the cable starts to tighten, look the situation over for good alignment, the setting of the snatch block, and see that the cable isn't rubbing on anything. Then set your engine at about **one quarter throttle** and let your clutch in slow like. Be sure to keep your tachometer* reading under 1000 r.p.m. Loads applied suddenly, called shock loads, cause twice the normal strain on the mechanism. This will probably mean a broken shear pin—but the line **might** go first. Make the driver who pulls this snatch climb down in the mud to change the pin and he'll maybe remember not to do it again.

OUT BY THE BOOT STRAPS



When pulling your own truck with the winch, anchor to something exactly in line with the direction you want to go, using your snatch block if you need to. Angle pulls tend to pile the cable up at one end of the drum and if it builds up over the top of the drum flange** it'll jam down between the drum and the gear case or around the sliding clutch. This ruins the winch line and may damage the winch. Always detail one man to watch for this **from a safe distance.** When the cable starts to pile up, either change the lineup by steering in the direction of the pileup or stop the pull and change to another anchor.

In pulling out another vehicle, it is always possible to line up exactly with the vehicle to be pulled or by using a snatch block. It takes only a few extra minutes to line up right and believe us, it saves a lot of time and trouble later.

Always be sure the rope isn't rubbing against rocks, gravel, or metal. If you really want to cut the cable, go get a cold chisel.

In tough pulls, anchor as far away from the winch as you can to get as much line off the drum as possible. On the 1½-ton

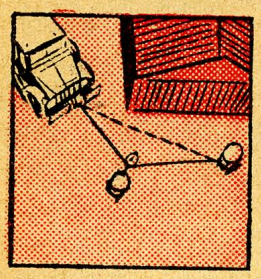
*Wouldn't be caught dead without one.

**Can't happen, of course, on shrouded drum.

and 2½-ton trucks the shear pin will let go at about 10,000 pounds pull when the winch line is on the first layer; **but will break at 5,000 pounds when the drum is full.*** On the 4-ton trucks the pin will let go at 15,000 pounds on the top layer. Just a friendly hint to save you the trouble of getting out and under to change shear pins all the time.

Center mounted winches have **no shear pins,** so you're much more apt to break your cable. That's **real** fun.

SNATCH BLOCKS



You got lots to learn about snatch blocks too. When you lead a line around a corner with a snatch block, the strain on the hook can be much more than the strain on the wire. If you bring the cable back to where you started from, a 10,000 pound strain on it puts a 20,000 pound strain on the block. If the cable makes a right angle around the block, a 10,000 pound strain on the line puts over 14,000 pounds on the block. **Nearly a third more!!** In which case the rigging to hold the block **should be twice as strong as the cable,** otherwise, you'll have some blocks flying through the air looking for G.I.'s. When the snatch block changes the direction of the cable 90 degrees or more, wrap your utility chain **twice** around the anchor and place the hook of the block through **both** loops of the chain.

*Different pounds on the M34, but same ratio.

SOME TIPS

After all this spiel, here are a few tips that will make things easier for the boys in the repair echelons . . . especially the Medical Corps.

Know your manual on truck mounted winches.

Keep away from winch lines.

Keep out of the angle made by the winch line and the snatch block.

Be sure there are never any kinks in the line.

Line the truck up properly before starting to pull.

Check the setting of the snatch block.

Watch the winch line, block and anchors for signs of overload.

Keep the cable properly and evenly wound on the drum.

Apply the load slowly and evenly.

Watch the winch line for broken wires, local wear, or broken strands.

(continued from page 77)

yourself a spray gun full of primer* and let yourself go. Coat the shoes, backing plate, springs, levers and other brake parts you find inhabiting the inside of that housing. And don't worry about the lacquer getting where you think it doesn't belong on friction surfaces. It is absolutely harmless, because when it isn't protecting something from rust, it is immediately and painlessly worn off of things like brake linings without harm to the linings or drums.

Now three paces East and we come to what is known as the rear-spring-seat assembly. We got two things on our mind in connection with this baby that'll only take a minute. Before you shoot grease in the fitting underneath, like the gentleman is doing in figure 15, loosen the capscrews like the gentleman did in figure 15, because the housing has no other relief port and the old lube has to come out past the cap like it did in that same figure, to wit: 15.

And when you have occasion to adjust the spring-seat bearing, which is located offstage in the above mentioned figure 15,

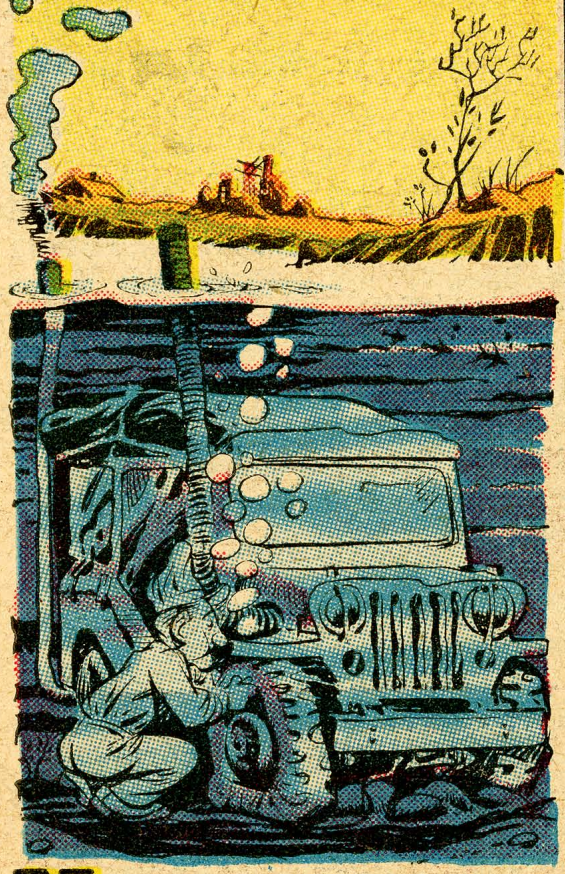
Primer, synthetic, lacquer resisting (see SNL K1).

(continued on page 87)

TAKE 'FIVE'

AND FIX YOUR M38

TO THE GUYS WHO HAVE BEEN PUTTING OFF THOSE . . . THINGS THINGS- I'M-GONNA-DO-SOME-DAY . . . WE SAY, "EITHER HIT OR GET OFF THE LOT."

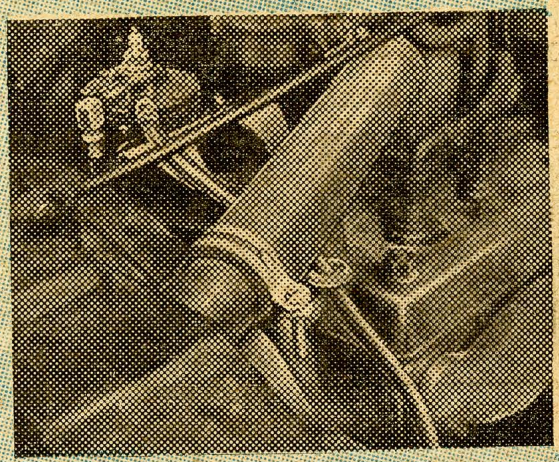


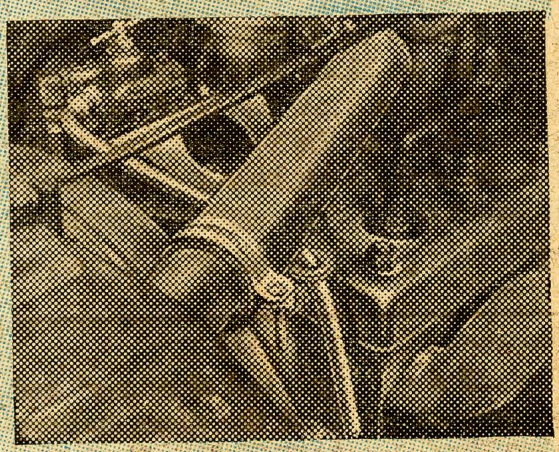
YOU KNOW as well as the next guy that you're gonna be posting that new jeep, M38, all over the countryside for a long time.

Any one of the five items below can be taken care of as easy as you'd drive a horseshoe nail, and will save you a kick in the face sometime when you're racing this nag across hill and dale.

1 FLEXIBLE OIL LINE

F'rinstance this oil line from the filter, that flip-flaps about two inches in front of the exhaust manifold; do ya know that when you're jogging along steady on a straightaway, this line lays back like a horse's ears and gets seared out in contact with the manifold elbow?





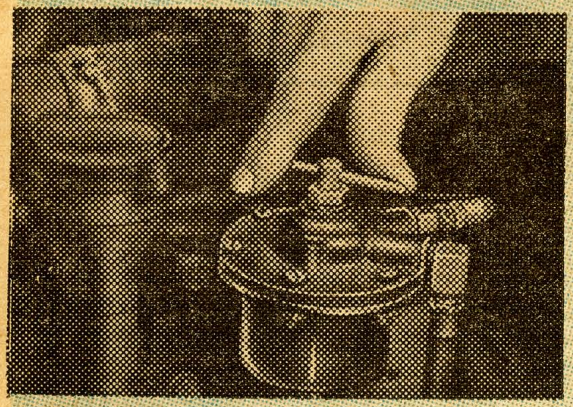
Latest and best tip from the readers for a quick fix, is to move the filter clockwise in its clamp, to the next bolt. This makes the oil line taut enough so it can't do itself harm.

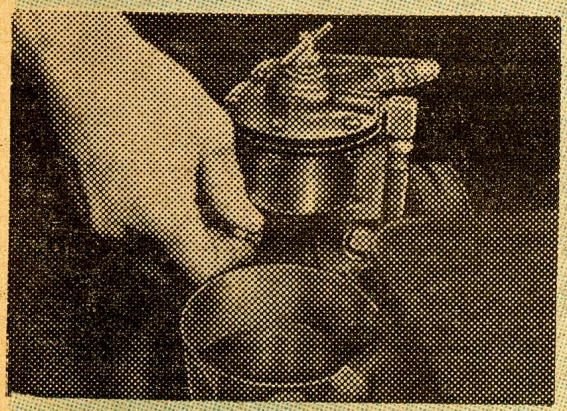
2 OIL FILTER SERVICE

In this same connection, they've been telling us about some Joes who screw around with those filter discs and then

get to screw 'em up again. This is the kind of thing Joseph Dope would be found doing, if Joseph were to be found servicing his oil filter . . . (which ain't likely because you know Joey).

So in memory of that last engine, now dead beyond recall, let us leave space between those discs so our filter can filt.





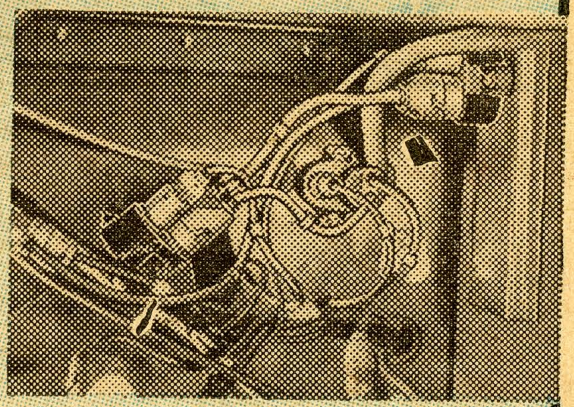
3 LOW TENSION LEAD

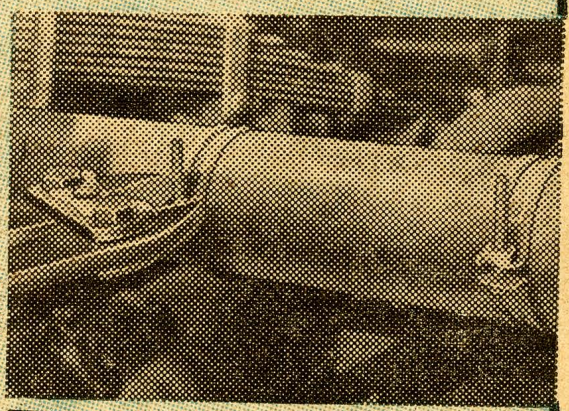
Also, while you got on your working mood, you'll want to swap that low-tension lead (from the filter to the distributor) for a longer one that won't rub through on the air-cleaner bracket.

Never know when a thing like that will cause a short where it makes that sharp bend around the metal, because the worn place is hidden by the angle of bend.

4 CIRCUIT BREAKER MOVED

Outfits that got tired of replacing that bottom circuit-breaker found an easy answer to their trouble. They simply moved it off the triple mount and fastened it to the firewall like in the picture. In this spot it is safe from the patter of little feet.

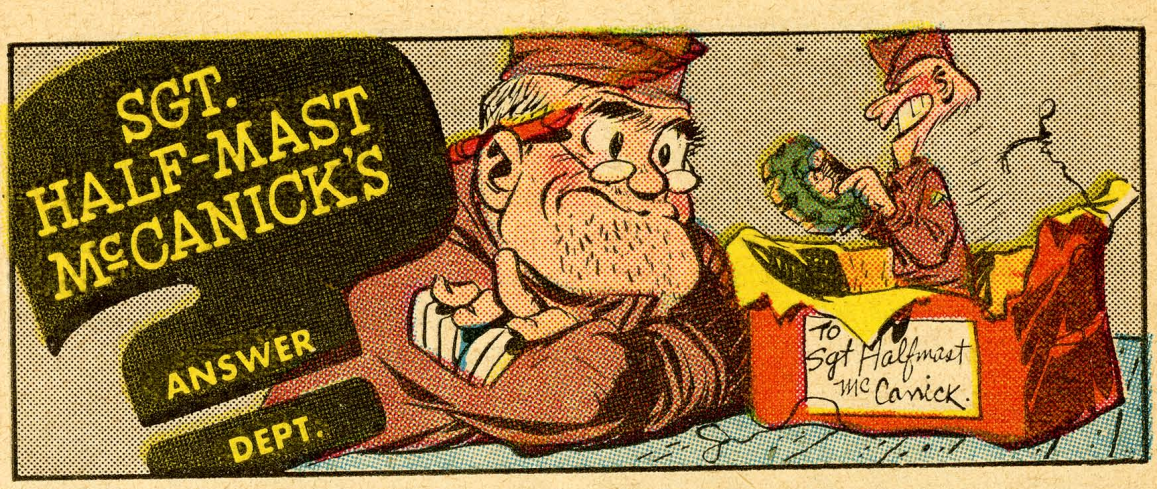




5 BRAKE HOSE CLAMP

And finally, for this session, let us arm with a pair of cutters and shear off what's left of the clamp bolt that holds the brake line on the front axle.

Good friend of ours named Oiving used to lie awake nights worrying over loose ends like this. Seems he was afraid he'd leave something dangle that would get snagged in a unsuspecting hole when he wasn't looking.



Dear Half-Mast,

For a long time I've been wondering why there can't be a way arranged to remove the jeep front propeller-shaft and joint without first removing the stump guard. It would save much time.

Sgt. G. B.

Dear Sergeant,

There is a way. Block up the front end of the jeep so you can turn the propeller shaft. Turn it around till the U-bolt nuts face the right side of the vehicle. (You can take the nuts off when they're facing that way.) Then slide the universal joint up on the spline to clear the yoke end.

You can do it that way, Sarge, but I doubt if it will save any time. Taking the shield (stump guard) off is just a matter of removing three bolts, and that's no major operation.

HALF-MAST

Dear Half-Mast,

We had an argument in our automotive section the other day about whether or not the fan on a GMC (2½-ton) was balanced. Some claimed it wasn't because of the spacing of the five blades. Others said it had to be, and was. Can you settle it for us?

Pfc. L. V. M.

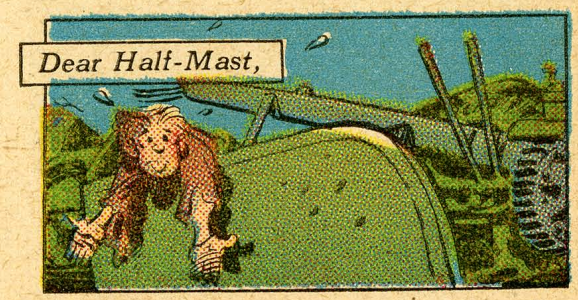
Dear Pfc,

Here's your chance to get scientific—this little experiment will prove that the fans are balanced: Break one blade off an old fan, then put the fan on the engine and let her run. The engine will act like "Shaky" in the Tracy strip.

When the fan is designed, it's balanced both statically and dynamically. Then all the dies and jigs are made up, using the original fan as a sample, and all measurements are held to a close tolerance.

The fan blades on the GMC's are unevenly spaced to eliminate noise. When five or more blades are evenly spaced, the flow of air when the fan is in motion makes just like a siren.

HALF-MAST



We have Signal Corps special equipment, four K-44's and eight K-43's and they're beauties. Chevrolets, 1½-ton 4x4's, and what winches! As you probably know, they're placed just back of the cab and set just over the power-takeoff assembly. You can do most anything with them, from dragging in a blond to moving a house. But here's my problem. I can't find a safety shear-pin. After first checking the winch assembly for said pin with

no luck, I tried the Maintenance Manual and the SNL—but I find I'm right back where I started. No shear pin. Yet in the spare parts kit that comes with this type truck, I find I have five Winch Drive-shaft Shear Pins. Now today it happened —two of my K-43's come in with broken winch cables. Well, after a quiet little session in the back office with the two drivers, about hitching on to a "cold" pole with their winch, I wind up with a few more grey hairs and two broken winch cables but still no idea as to what to do in the future to prevent this trouble. Can you kindly enlighten me on this subject so that I can go to bed at night without having winchmares.

Lt. J.R.S.

Dear Lieutenant,

If you've been having broken-winch-cable trouble, maybe you can tell us a way to modify this winch drive-shaft to take a shear pin. But the idea of this winch was for the **drive chain** to act as a shear pin. There's supposed to be a weak link in the drive chain. If it ain't letting go under overload, maybe you'd better check the chain, and maybe rig up your own weak link. About finding them spare shear pins in the spare-parts kit—all Chevvy 1½-tons get the same kit. It's easier than making up a special one for trucks with their winch amidships.

HALF-MAST

Dear Half-Mast,

We've been having trouble with the gas tanks on our 2½-ton GMC's, model CCKW-353. The front corners of the tanks get knocked in by every stick, twig or branch in the neighborhood, and they leak all over the place.

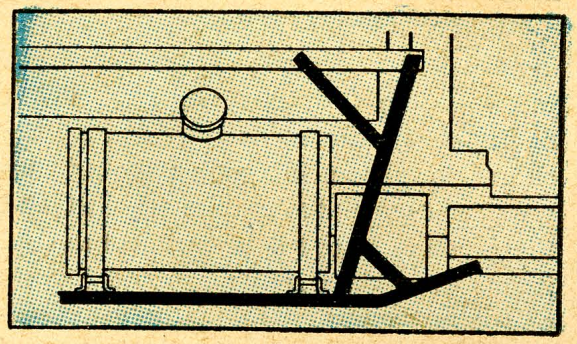
I fixed up a bracket (see Fig.) which, when bolted on, prevents this trouble. The bracket will also serve as a running-board support. How's about it?

Sgt. A. L.

Dear Sergeant,

S'right sharp idea. As long as you're doin' it, why not use the wider plate and run it from the running-board to the bottom of the tank, tip the sides up slightly and have full protection for the tank bottom? A 16 gage of 1/8" metal will do it. To brace the running-board, attach the bracket to the vehicle frame. The front end of the body is spring mounted and flexible, and vibration might damage the tank.

HALF-MAST



Dear Half-Mast,

We've been having trouble with our 2½-ton GMC brakes. The trouble is in the hydraulic piston and valve assembly. The rubber cups swell up.

We've taken every precaution to see that the mechanics don't wash any parts of the brake system in solvent or mineral oil; yet the cups swell and cause plenty of trouble. The drivers claim the trucks drink brake fluid, and they're right, because most of the time these cups in the early valve-assemblies don't hold. The fluid passes from the cylinder into the tube assembly, then into the hydrovac shell, and from there into the vacuum line, the intake manifold, and the combustion chamber. The fluid not burned by the engine goes out the exhaust tail-pipe.

We have experienced most of this trouble with 1943 GMC trucks. Please put me on my dogs, because we have enough brake trouble in this Pacific area without

the hydrovac unit acting up.

Sgt. H. L. M.

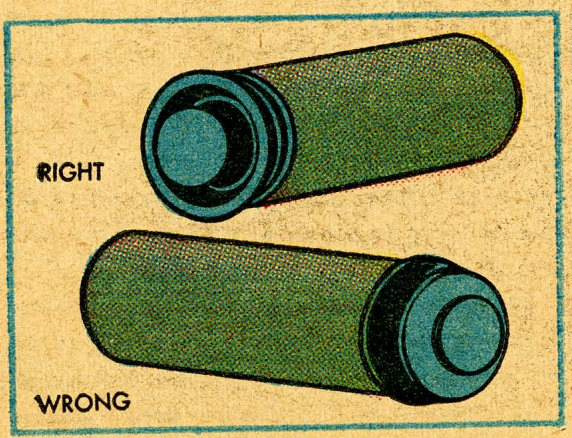
Dear Sergeant,

It's kinda tough to figure out your trouble, since you're sure somebody ain't washing the brake parts with solvent or mineral oil. The wrong type of brake fluid (containing mineral oil) would cause swelling cups, but then all the cups in the system would swell. And if only the rubber cup in the hydraulic piston and valve assembly is giving you trouble, the brake fluid can't be the reason.

What could be your trouble is improper installation. The cup (on the end of the piston in the hydraulic adapter) oughta be installed with the flat face against the end of the piston. If it ain't installed that way, when the brakes are applied and the pressure of the fluid smacks the cup, it smacks in the wrong place and distorts or swells the cup. Also, with the cup installed bass-ackwards, the lip is toward the hydraulic piston and away from the direction of the flow of fluid — which means not enough resistance from the cup, so the fluid squeezes right by and enters the hydrovac shell. That's probably what's happening when the drivers squawk about trucks "drinking" the fluid.

So try checking the installation of those cups. The flat face goes against the end of the hydraulic piston (see Fig.). And I'm praying this gets rid of your trouble.

HALF-MAST



Dear Half-Mast,

Recently received new M51s (5-ton 6x6 International Dump) at this camp and have had four fan-belt failures at less than 500 miles. Breakage is in cross-section and indicates cord separation. Belts also show a worn ridge on angle-drive faces about an eighth of an inch from the top face. We replaced the four with new belts but haven't driven them far enough yet to see how they're working out.

What, if anything, do you know about it? *Mr. N. H. P.*

Dear Mr. P.,

I checked the best engineering sources on this question before I dare answer . . . because Mr. P. . . . and this'll knock you right out of your dump truck . . . Those M51 belts are normally to be adjusted **as tight as you can make them.** Allow no deflection (except belt resilience) between pulleys.

They use a torque wrench at the factory, and suggest you tighten them at Camp McCoy with your torquemattock handle behind the generator for leverage.

Ever hear such a thing? Neither did I. That's why I thought the rest of my friends oughta know too, so they won't go around loosening proper adjusted fanbelts.

Come soon again Mr. P., glad to hear from you. HALF-MAST

P.S. YOU'LL BE HEARING MORE ABOUT THIS.

THE CHAPLAIN'S ASSISTANT

The Chaplain turns all maintenance problems over to Half-Mast — all them big and little aggravations you got piled on your achin' back. If there is an answer, Half-Mast knows where to find it. Try him . . . write: Dear Half-Mast, P.S. Magazine, Aberdeen Proving Ground, Md.

(continued from page 46)
the uniform, my God! The only decoration any of these instructors and drivers need is a campaign ribbon with stars. That's what counts, isn't it? (Or maybe a Unit Citation?)

I don't doubt that the new mechanic schools are doing a great job, and turning out some excellent workmen well qualified to "Keep 'em Rolling," but I wonder how big a percentage of their time is spent on field expedients and jawbone repairs which are so necessary in the field.

Major Ingersoll in his book, "The Battle is the Pay-Off," suggests eliminating all barracks and permanent installations from the training program. I can think of nothing that would be finer for the 2nd-echelon men than to be obliged to do their work under field conditions from scratch. We are unusually fortunate just here; we have a tarp over the grease pit, a shop truck for our tools, and a tent for tire and battery work. The "shop" is an acre of ground (mud when it rains) behind the shop truck. The air compressor (pending parts on ours) is miles away on the line. The office is a grass shack, and the service station is a pile of drums and a hand pump.

Mind, I'm not complaining about this—we do fine, thank you. But I'm suggesting it as appropriate training conditions for our replacements. (And you can send us them any time you like.)

P.F.C. HARRY R. McNEAL

(continued from page 81)
behind the cover, you **should not** back off the adjusting nut like you would one of the wheel-bearing adjusting nuts because this here bearing is meant to be preloaded. That means adjusted up to snug so there is **no clearance** to let the bearings rattle loose and brinnell themselves to death.

The plain-to-see reason is that this bearing normally does not turn like a wheel bearing. It sits still, or rocks back and forth from the spring action. Doing thus, it is subject to all the shocks of Korean and other, or domestic variety of washboards, and will if left room to do so, hammer itself flat in almost no time. More work for you changing bearings, and more money out of Joe Dope's remittance from home.

TRANSFER-SHIFT LEVER

Had to happen sooner or later in this story, we had to open our big mouth about something underneath the truck. So with a short break for one long groan, you will please to crawl behind us and learn the right way how we make a slight adjustment to the transfer-shift linkage. That is if this particular truck we're about to crawl under has the double-sprag-type overrunning-clutch.

First, however, we jack up either front wheel and put the transfer shift-lever into neutral. Then (now you have to look back and forth from figure 16) we shorten link #RC820-T5 until lever #RC826-T5 is in maximum forward position. Then we lengthen the link (just a wee, mind you) until the lever barely starts to move. And by barely starts, is meant no more than 1/64 to 1/32 of an inch.

The trouble with this deal has been that some people's idea of 'barely starts to move,' has sometimes been as much as a

(continued on page 88)

JEEP SLING

ORDINARILY, when you evacuate a helpless jeep and have to lift it on or off a cargo truck with your wrecker, you hoist the victim by wrapping a chain around it. This gets it where it's going, but often the jeep is in even worse shape when you're through because the chain damages the body. To save a lot of unnecessary repair work, the 881st Ord. HAM Co. got busy and devised a simple sling that holds the jeep firmly but never leaves a mark.

The sling is made of a reinforced 6" I-beam, a chain with a hook at one end, two chains with hooks on the other end, and two heavy metal rings near the center of the beam. You reinforce the I-beam on both sides, preferably with U-channel iron if you've got it, otherwise use plate. It's better not to extend these reinforcements along the beam's full length or it'll increase the sling's weight considerably. Instead, you can place one at each end and overlap them in the center for added strength under the ring holes.

In case you can't find an I-beam, two pieces of frame side-rail bolted or welded together will do just as well and you won't have to bother to reinforce it. You'll find the exact dimensions for building the sling in Fig. 1.

To put this sling to work, first lower the top and windshield of the ¼ ton and see that the rear seat is level with the back edge of the body. Then place the I-beam lengthwise over the jeep with the single-chain end to the rear (Fig. 2). Hook the single chain in the pintle, or if there isn't any, under the rear edge of the frame. Then hook the other two chains under the two frame-ends supporting the front bumper. After you place the wrecker hook through the center rings, you can gently lift the jeep to where you want it with nary a slip.

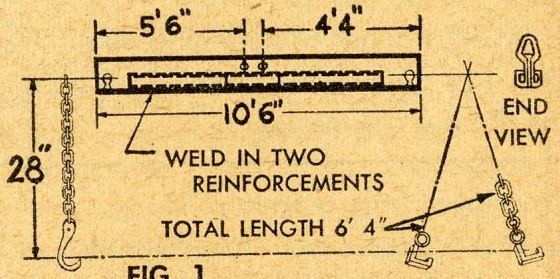


FIG. 1

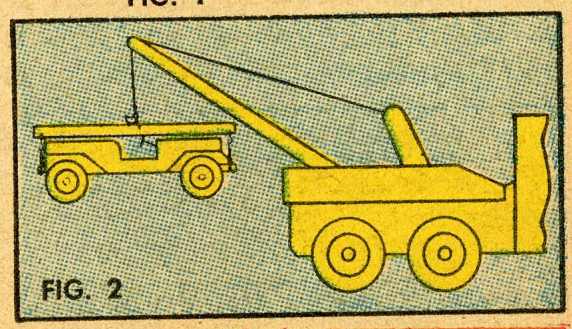


FIG. 2

(continued from page 87)

half inch; which is the main cause why some of your M34's haven't been going automatically into and out of front-wheel drive. Seems that when this adjustment isn't fine enough, like is told about above, the overrunning-clutch forward-drive gear can't be engaged by the shifting fork.

We check our adjustment like so:

1. Put the transfer-case shift-lever into reverse.
2. Face the rear of the truck and turn the propeller shaft one revolution counterclockwise.
3. If all's well, RC826-T5 is in maximum rear position.

Remember though on the single-sprag M34's, the SOP on shifting is to **always shift to first gear** after you've been in reverse.

And so to bed. Dog tired. But happy.

A LOTTA LEFT HANDS DON'T KNOW WHAT THE RIGHT HANDS ARE DOING . . . WHICH JUST AIN'T SMART.

A cloud of dust rose from the rear of an M4A3 medium tank and almost filled the corner of the shop. A Pfc., holding a long thin extension pipe rigged up on the end of an air chuck, was blowing away at the radiator.

"What's cookin' up there?" we asked.

The Sergeant explained, "Oh, that's a little thing we have to do to keep from burning up some of our M4A3 tank engines. We burnt up a couple before we found out a funny thing about the radiator cores.

"The core looks like a solid core, but if you take up the strip of metal that runs all along the top of the radiator, you can see where it's split longways down the middle. There's only about a ¼" space between the front half of the core and the back half, but hunks of weeds, dirt and all kinda stuff packs down in there. Then the fans can't pull the air through the core and the engines heat up. We blow 'em out with that long thin extension on the end of an air chuck every 100 hours."

"Looks like a damn good idea. Did you write in a Form 468* on it?"

"Well, I've been kinda busy, but . . ."

In another shop a man said, "We had trouble with the M5 bomb service trailer. Get towing a load of bombs across a cement ramp, and even at low speed the trailer starts to shimmy and throw bombs overboard. We fixed it by putting set screws on the swivel yoke on the front-axle caster unit to keep it from dancing in the dampener shoe."

"Sounds good," we said. "Report it on a Form 468?"

"Wal, we've been a little rushed lately, and . . ."

The story to be drawn from these two small dramas is not how do you blow weeds and dust out of a tank-radiator core, or how do you modify a trailer to keep it from scattering bombs. The story is that here are two good ideas—both gathering flyspecks in the corner of somebody's skull.

Because these local expedients are such closely guarded secrets — because somebody was too busy or lazy to send in an "Unsatisfactory Equipment Report" and drop a line to P.S. Magazine—these great and good ideas as the poet says, "waste their fragantz on the desert air."

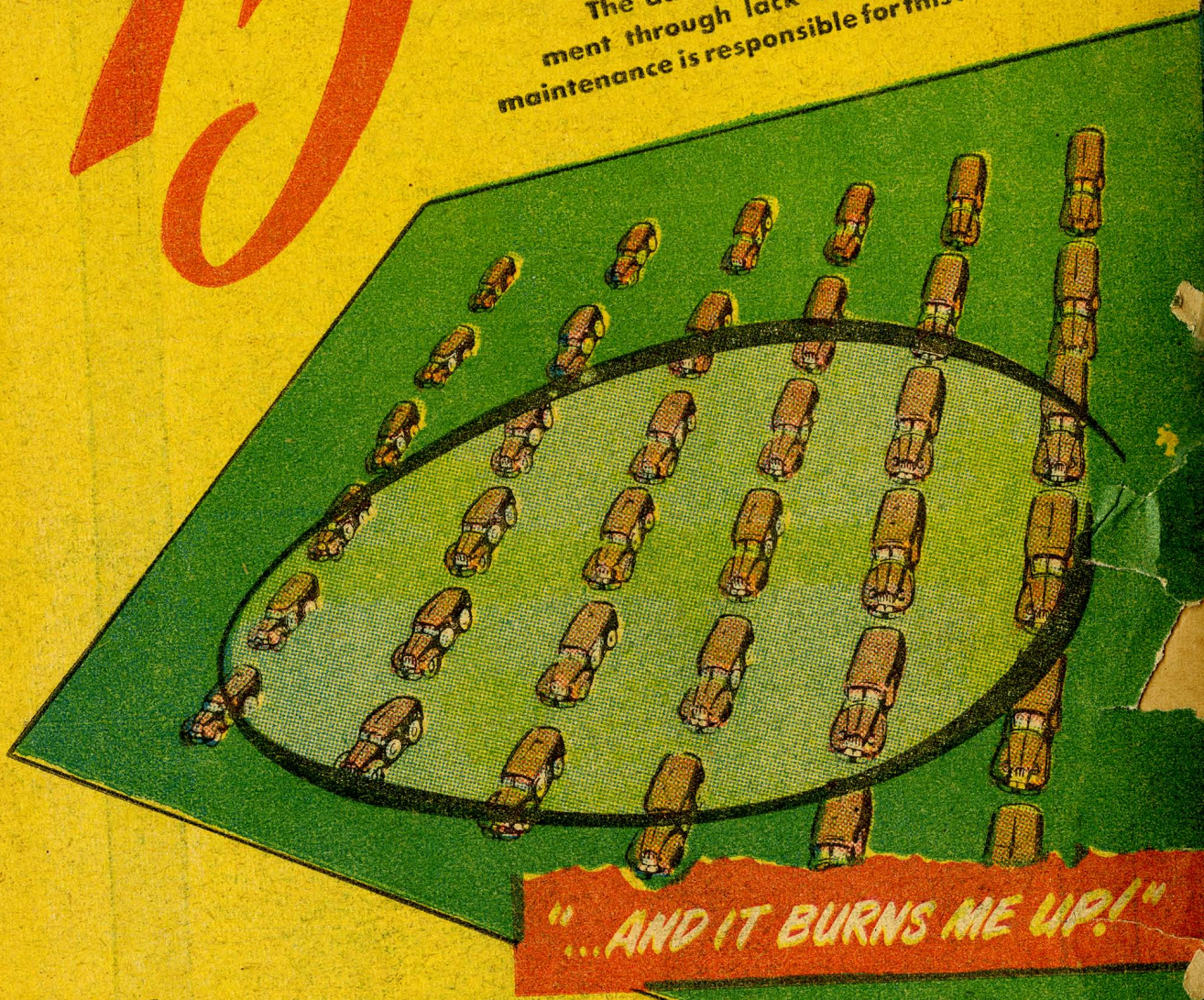
You got an idea? Let's take a look at it. If it's good we'll make your name a household word. If it's bad, we'll tell you what you can do with it.

But don't keep it a secret.

UNSATISFACTORY EQUIPMENT REPORT

75%

...of the 1st and 2nd-echelon work we receive in our shops for major repairs is due to neglect. The damage done to high-priced equipment through lack of 1st and 2nd-echelon maintenance is responsible for this terrible waste.



"...AND IT BURNS ME UP!"

M/Sgt. D.S.W., TEXAS